

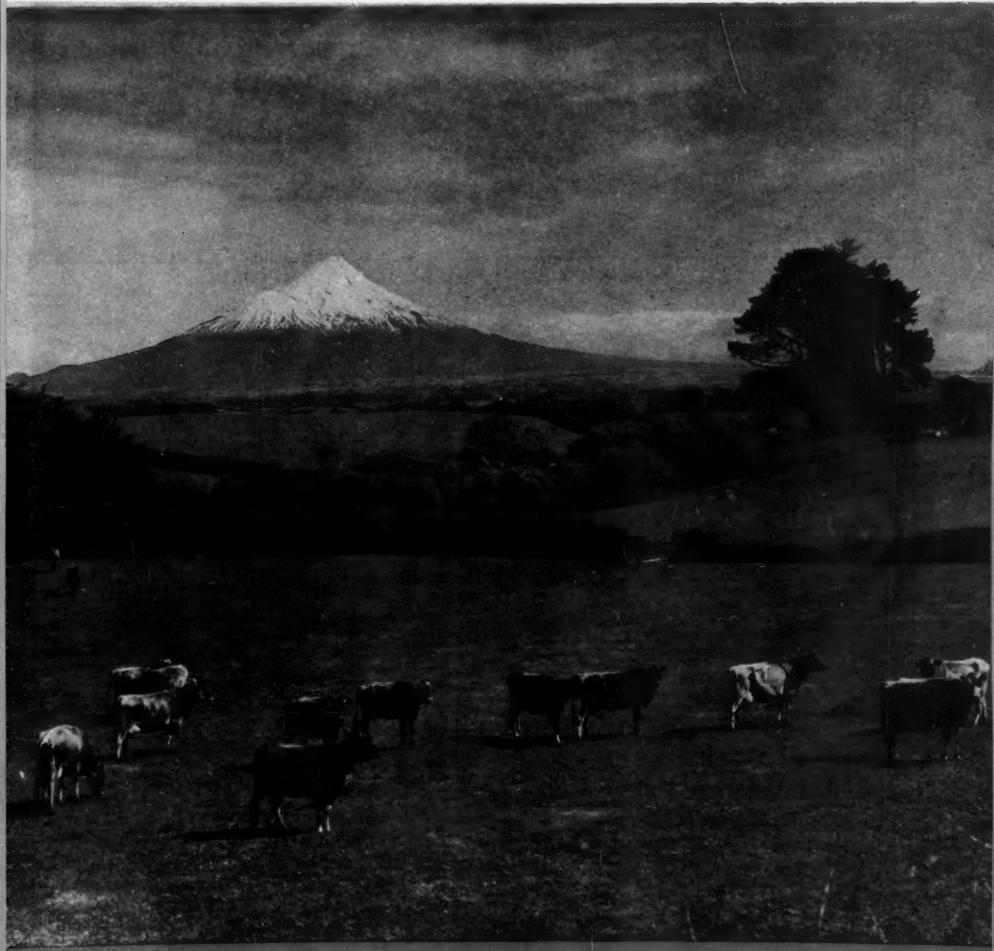
agriculture

Vol. 75 No. 8

August 1968

Published for the Ministry of Agriculture, Fisheries and Food
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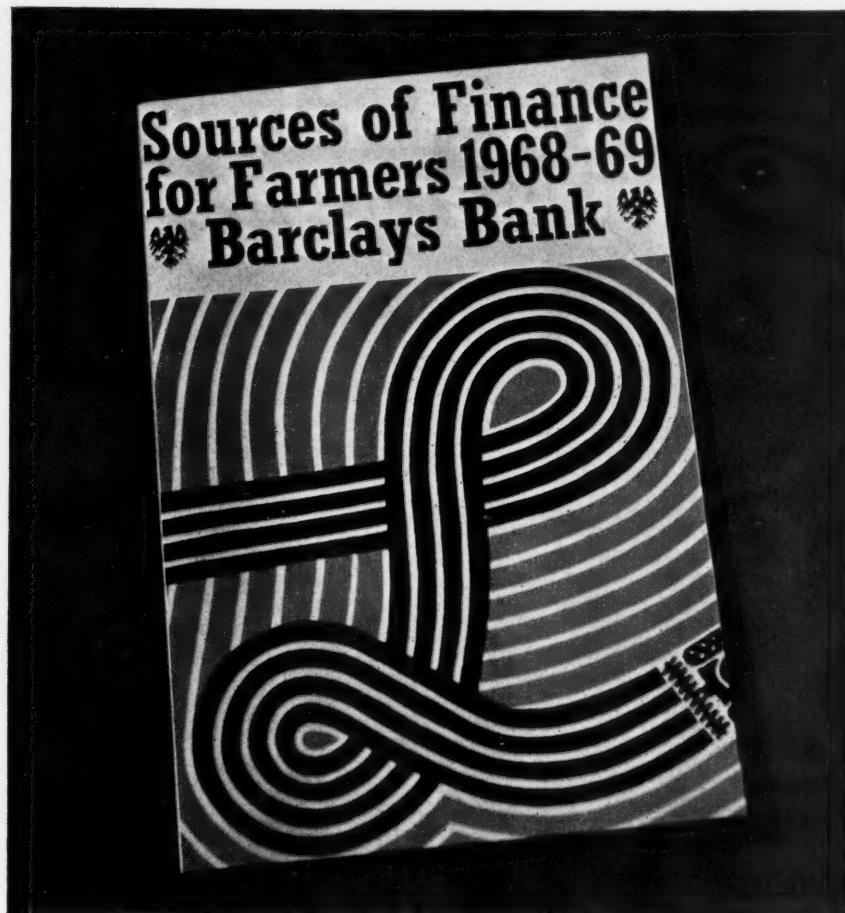
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Agriculture

VOLUME 75

NUMBER 8

AUGUST 1968

Editorial Offices

Ministry of Agriculture, Fisheries and Food
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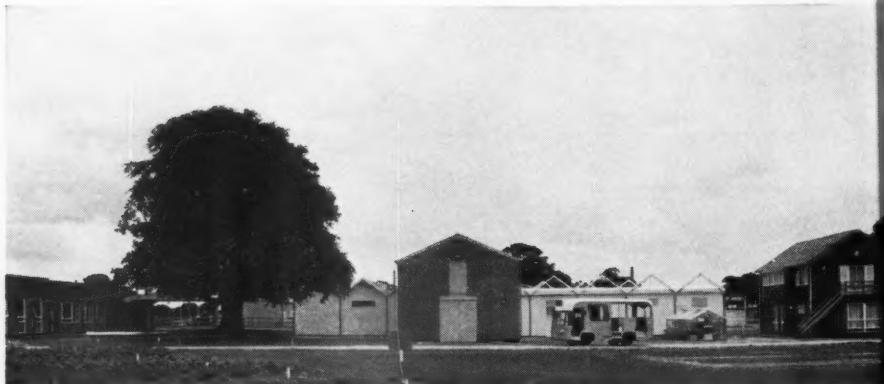
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Professional Advice on Farm Buildings

R. B. Sayce

AN architect, speaking at a conference on farm buildings, told of a farmer who telephoned him and asked for his help. 'What can I do for you?' said the architect. 'Well,' replied the farmer, 'I thought you would draw me a picture of a building!' So, of the vast range of skills at his command, all the farmer thought the architect could do was to draw a 'picture'!

It is not unreasonable that a farmer should know very little of the skills available to him through the employment of a professional adviser. After all, there are professional men who know little of farming. Furthermore, there is no sales promotion of the professional wares. Brain power, it seems, is less advertised than horse-power! With regret it must be recognized that, on the farm, the man who works with pen and paper is held in less regard than the man with mud on his boots and an auger in his hand! A cow bought for £125 is tangible evidence of value for money (and can be milked); £125 spent on professional fees can only be seen in the abstract. All the more reason, therefore, that before asking the professional man to draw a picture for him the farmer should turn to those who can advise him generally on the type of professional help he needs with his problem. It is at this early stage that the Agricultural Land Service can usefully be brought in.

Agricultural Land Service

The Agricultural Land Service comprises qualified land agents, surveyors and architects who give a free advisory service on the design and construction of farm buildings, and on the worthwhileness of capital investment. In conjunction with the National Agricultural Advisory Service, comprehensive advice can be obtained ranging from the primary agricultural factors, through farm business and capital investment analysis to the design and construction stage. But the A.L.S. does not give the full range of services that private qualified individuals and firms provide. Nor can a state advisory service give that personal attention which is so valuable; once, however, the A.L.S. has given the broad basis on which a project may be founded, the farmer will be clear on the type of professional adviser best suited to his needs and can then go ahead and engage him. He can thus get the best of both worlds and concentrate on his own profession—farming.

Specialized services

There is a wide range of advice and services available which can be applied to farm buildings and other fixed equipment. There are, also, many different types of advisers, from architects, land agents, surveyors and engineers to agricultural and farm management consultants. All operate either in their specialized field or cover more than one field. To simplify the situation we can consider the subject in three broad sections, although there is really no clear demarcation between them and the edges are blurred. The three sections are: technical agricultural considerations, capital investment appraisal, and architectural and constructional matters. Many professional men operate in only one of the sections, but there is the occasional individual who can work in all three. The first section will include private consultants with agricultural qualifications (either individuals or partnership firms), agricultural firms such as fertilizer and feedingstuff merchants and quasi-public bodies including marketing boards, and educational establishments. From these sources a farmer can obtain advice on matters such as feeding methods, optimum environmental and storage requirements, and feasible operating methods for buildings. For personal, tailor-made advice on these initial design factors the farmer must look to the private consultants and there are not many of them. The professional bodies are alive to the need to provide services in this direction, particularly the Royal Institution of Chartered Surveyors, the Chartered Land Agents Society, and the Chartered Auctioneers and Estate Agents Institute.

Taking responsibility

In the second section, members of these three bodies are more readily available to offer a complete service. In fact the traditional source of investment advice for the landowner on fixed equipment is the land agent and surveyor. There are others who offer a service in this section such as bank managers and farm management consultants, but they do not purport to offer a complete picture to their client as does a land agent. The resident land agent takes this in his stride as part of a comprehensive job of estate management. But for the farmer there are many firms of surveyors and land agents who will give general management advice including the relationship of the financial consequences of investment in farm buildings to the management policy on the farm. Here they can compare the relative benefits of alternative possibilities of investment. This kind of service is, today, an absolutely vital pre-requisite to the investment of fixed capital on the farm.

It is in the third section that professional services can take the burden of responsibility for the farmer, and it is this taking of responsibility that is so valuable. Once a decision has been taken to go ahead with a major project the detailed planning work begins. There are plans to be drawn, with every detail to be shown, specifications to be written, and then these have to be priced. A survey to scale may be needed of the existing buildings or the chosen site. At this stage materials that give the best performance must be selected and all the technical data determined in the first two stages must be incorporated. The professional man will need many consultations with his client, and perhaps with other advisers.

In this complicated world in which we live there will be many authorities to consult. Planning permission, building regulations, safety regulations, milk

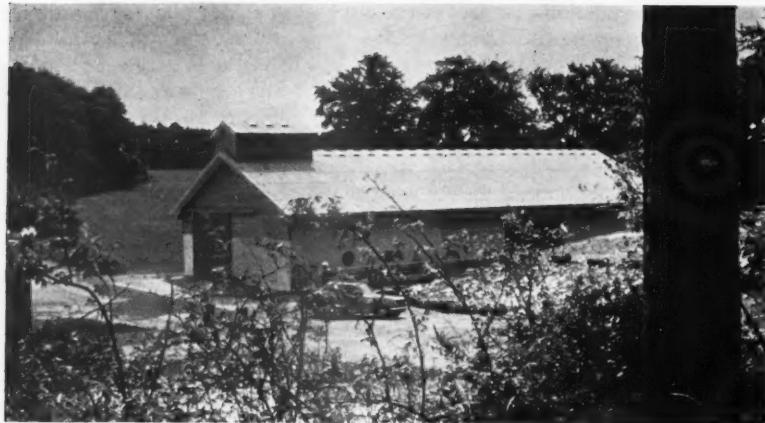
and dairies regulations, control of the disposal of effluent, licence to abstract water, obtaining grants of many kinds—these are just some of the burdens of life today which the professional man will handle with ease which comes from expert knowledge and experience. After all, the farmer may have to deal with them once or twice in his farming life: the adviser is constantly coping with different variations of the same thing all the time.

Yet, even when he has at last prepared all the plans, specifications and surveys, and has obtained all the various permissions, his job has only just started. He must now get a builder to do the job; this means going to tender and selecting, with his client, the most suitable quotation. As soon as the builder has started, the work needs to be supervised to ensure that the standards and methods are being adhered to. There may be, and often are, variations and additions. These need particular supervision otherwise the cost may rocket.

Scale of fees

At the end, the builder must be paid, after the work has been certified as satisfactory. Grants may be waiting to be claimed; regulations to be certified; until this is done the professional man has not finished and earned all his fees. To those who regard professional work as something of a mystery, this very brief summary of the services offered may come as a surprise. Not so the bill—for this is often regarded with suspicion. It should not be so, because professional fees are charged according to recognized scales. The Royal Institute of British Architects publishes a scale of fees for all the work which its members carry out and similar scales are adopted by the other professional bodies. The scale covers not only the full services as described briefly above, but also the fees for partial services. Should a professional man be engaged it does not have to be on the basis that he will only give the full service or none at all. Indeed, the farmer may often have need of only part of the services, as, for example, where he wants to do some or all of the building work himself. The advice could be limited to the supply of a working plan and a simple estimate. For this service the fees would be much less than the full scale fees. The scale fees are based on a percentage of the cost of the job. This percentage for a full service for new works ranges from 10 per cent for the smallest projects to 6 per cent for those above a figure of £16,000. Out-of-pocket expenses may be charged above this percentage. Bearing in mind the work which is done, the overhead costs of maintaining an office and its staff, and the general effects of inflation since the scales were last altered (a good many years ago), the employment of a professional man is good value to the farmer who has enough pressing problems in running an efficient and profitable farm.

The author of this article, **R. B. Sayce, F.R.I.C.S., F.L.A.S.**, is the Ministry's Divisional Land Commissioner at Oxford.



An Asset to the Countryside

Norman Hilton

WITH the nation's limited land resources under heavy pressure, it is becoming increasingly important to attain a multiple use of land, including a more successful marriage of agricultural and recreational activity than has traditionally prevailed in Britain's rural areas. A possible obstacle to success could be the loss of many picturesque farm buildings which have long contributed to the aesthetic attraction of the rural landscape, and their replacement by more efficient structures which, though essential to the proper agricultural use of the land, could easily destroy its amenity value. If agricultural efficiency is to be a part of our land use policy, the inevitable price will be a further mushrooming of new architectural forms in the rural landscape, and the more traditionally-minded lovers of the countryside may well find difficulty in reconciling themselves to any of these new features. Currently, however, even that section of the public that appreciates the need for change and development is rightly concerned at the course of events, particularly at the inferior quality of many new structures irrespective of style. To these people at least, agriculture has a responsibility to look very carefully at the aesthetic implications of its farm building programme.

A useful approach to the problem

The photograph above illustrates an example of new farm building in which a conscious effort was made to remedy the widely held impression that agriculture's technical and economic requirements are incompatible with good appearance. The dual purpose grain store/young stock housing unit is at Chalkhill Barn on the Lockinge Estate in the Berkshire Downs and is essentially functional and modern in concept.

When estate owner, Mr. C. Loyd, decided that a new grain store/young stock housing unit was required on an attractive approach to Lockinge, his inclination was to locate it on a conveniently well-hidden site. But having difficulty in finding such a location, he agreed that his farm manager, Mr. P. Haigh, should explore the possibilities of producing a practicable building fit to be seen on a prominent site. Mr. Haigh drew on his recollections of some pleasing Swiss buildings, and concluded that their quality derived largely from these. He then, with the help of the estate staff, a local engineering firm and the A.L.S., translated his ideas into a workable design. A simple cardboard model was produced as an aid in assessing the three dimensional appearance of the planned work and construction work began with the aid of a financial grant under the Farm Improvement Scheme. This sequence of events is not typical of the way we generally prepare for the erection of a new farm building in this country, yet the procedure adopted seems to make good sense in a society which must use the bulk of its land for both agricultural and amenity purposes. It should be noted that the completed building contains commonplace modern materials which are generally available throughout the country—and if it has any merit as compared with the more usual type of farm building, this must undoubtedly be attributable to the timely application of a little careful thought.

Some features of Chalkhill Barn farm

The first noteworthy feature of the Chalkhill Barn building is the siting. The building is not directly screened from the normal viewpoints, but it is located in a gentle dip away from any skyline. Most objection to skyline siting occurs when the building itself lacks a pleasing appearance. However, most British farmsteads are set below the skyline, so the continuance of this tradition will probably be welcomed by most people. As may be seen from the photograph, existing trees have been used so as to blend with the building in making a pleasing composition.

The building is presented here as a workaday building which, in the British tradition, harmonizes with our man-made and dynamic rural landscape. If one accepts that architecture and monumental buildings are not necessarily synonymous, and that the essential qualities of British architecture in particular have tended to be expressed in the more modest type of building, then we may indeed have produced something of architectural significance. But, the important thing is to view the Chalkhill Barn building in the context of a national farm building programme which is technically and economically efficient.

The essential quality of the building lies in the proportions derived from its basic dimensions—90 ft (length) \times 50 ft (span) \times 13 ft (height to eaves) \times 23 ft 4 in. (height to ridge). These result in a medium-pitch gabled roof and a simple rectangular basic form which is relieved by a penthouse accommodating the grain elevator. The penthouse is built to the same proportions as the main structure and contributes materially to the pleasing overall shape. Achieving these proportions called for careful consideration and involved higher than average costs for the steelwork.

The detail of the building is mainly as good as the basic form. In the first place, good workmanship has resulted in a neat fitting of the asbestos roofing sheets which is not always apparent elsewhere, and the sheets themselves are uniform in colour and texture. Together, these small points

ensure that the roof, always a prominent feature by reason of the way it receives sunlight, avoids that dilapidated appearance which is all too evident on some buildings. Other points about the treatment of the roof are also worthy of note. The line of ventilation gaps, though strictly functional, is also aesthetically advantageous as an edging to a large white surface, and the asbestos encasement below the overhanging eaves also serves to provide a solid looking finish. The purpose of this latter feature is mainly aesthetic. Most important of all are the thirty-inch overhanging eaves and the extension of the roof at the gables. In the British climate, these are an aesthetic feature, but few people who have seen the building doubt that they are the most obvious asset of the whole structure. Apart from these features of the roof, the building also exhibits some interesting detail in the cladding of its vertical surfaces. The main curtain wall is built of concrete blocks and coloured in a creamy whitewash. This, in part, is functionally superfluous, as it masks the pre-cast concrete walling of the grain store. Given the adopted proportions, the building would still have possessed a high degree of visual attraction without the addition of this feature, but the owner, in the interests of appearance, decided to adopt the continuous curtain wall up to eaves level and this undoubtedly imparts a neatness and unity to the building. Windows were not necessary; their presence would attract sparrows into the building and the openings for access provide sufficient light for stock. Above the white creamy walling, the vertical faces of the penthouse and the gable are clad in horizontal shiplap cedar boarding, which illustrates the merits and problems of mixing various cladding materials in a single building. Generally speaking, any change in cladding material emphasizes the basic elements of a fundamentally pleasing and functional structure—and in using cedar boarding on the penthouse and gable, the treatment of this building is substantially correct.

The use of colour in farm buildings is a controversial topic. On the one hand, it is the glaring whiteness of new buildings which give rise to most complaints from the public, and the judicious use of colour in accord with the dominant hues of the landscape could produce a more pleasing effect in many instances. Three things should be more widely appreciated. First, distinctive but subtle coloured materials are more readily available, and these permit an adventurous approach to the problem. Second, the application of colour to harmonize with the landscape is not the same thing as attempting to camouflage, a procedure which rarely succeeds with either good, bad or mediocre buildings, and which should be quite unnecessary with good basic structures. Third, colour is generally successfully applied in a selective manner which emphasizes the structural elements of the building, hence it may be used sparingly to minimize any additional costs involved. Colour emphasis of the roof alone is often sufficient.

The Chalkhill Barn building is predominantly white, the only relief being the natural colour of the cedar boarding and a grey sliding door. The question of colour was considered in planning the building, and an overall white effect was decided upon. There are a few hard and fast rules in this matter of colour choice, and the introduction of an alternative subtle colouring on the walls could have been very effective. Nevertheless, the landscape of the Berkshire Downs is essentially a green and white one, and there is nothing incongruous in a white building amidst patches of chalk soil. The chalkland location may even justify the use of a white roof in this particular instance, despite the fact that darker roof tones are generally considered

more satisfactory. Yet, if this building can be faulted it must be in the colour treatment of the roof for, whilst its whiteness seems perfectly reasonable in relation to the colour of the landscape, it does not emphasize the good proportions of the building as well as it might. Of course, the asbestos sheeting will probably weather to a darker tone. This will produce sufficient contrast to give the desirable emphasis of structure, but whilst a well-weathered roof is generally desirable if set amongst a mass of old and traditional structures, it may never look right on this essentially smart and clean modern building. Consequently, it might have been better to have adopted a contrasting roof at the outset.

In all matters of appearance the question of colour must loom large. Taste must certainly affect one's reaction to the type of argument presented above, but on critical points such as the inter-relationships between the major structural elements of a building, there are some reasonably well-defined principles to be considered. However, when we consider certain minor details we often have to grope around without the benefit of any accepted framework within which personal decisions might be reached. The selection of colours for wooden trimmings is a case in point. The door at Chalkhill Barn is painted pea green/grey and who can say whether this is right or wrong? Beyond the fact that pillar-box red would probably have been offensive to most people, there is clearly scope for considerable variation according to taste. Yet even so, colours can be made to play a positive role in attaining a satisfactory visual relationship between minor features and the basic lines of a building. In this instance, the door inevitably makes a break in the otherwise continuous lines of the building, and demands some kind of positive treatment. One solution would have been to play-down the feature by attempting to match it to the walls, but this would have been difficult in a building with such clear cut lines. Alternatively, the visible break in the horizontal line should be emphasized by the use of contrasting colour, and this is the effect obtained by the use of the grey paint. In the photograph the contrast is probably sufficient, but the effect in reality is perhaps a little insipid. The use of a strong but subtle colour would have been permissible and would have been more in keeping with the bold positive approach adopted for the project as a whole.

The cost of good appearance

Some farmers, probably the large majority perhaps, display little evidence of their concern in the buildings they have actually erected during the past decade or so but turn out to be quite sensitive to the problems once these are drawn to their attention. If the appearance of a building is unpleasing, they recognize this as soon as anyone else, and apart from the fact that their reaction is probably tempered by a more realistic assessment of the difficulties involved in producing something better, this too is probably similar to that of the non-farming public. They see the obvious results of a nation-wide failure to take essential action, but they fail to analyse what they see, consequently failing to identify the critical elements which should receive attention when next they find themselves adding yet another building to the rural landscape. This is the root of our present problem, and it can only be remedied by advice to farmers on the basic principles involved. Fortunately, some measures to this end are being taken by official and private organizations,

and it is hoped that this account of an individual farmer's efforts may serve to supplement the guidance now beginning to come from other sources.

Whatever architectural advice is eventually provided to help farmers make their buildings more attractive, there will be little point in any which ignores the *raison d'être* for all new farm structures, technical and economic efficiency. Much of the advice now being contributed by non-agricultural bodies shows a marked lack of appreciation of the fundamental purpose of farm buildings, and fails to realize that the economic operation of a building depends on keeping a tight rein on the initial and subsequent expenditure. This kind of advice is usually ineffective, partly because the farmer genuinely cannot afford to take it, and partly because he may have doubts as to whether the financing of amenity for a predominantly urban population is really his responsibility. However, this is not to say that the farmer cannot afford some expenditure over and above the minimum required for a functionally satisfactory building, nor does it mean that he is unwilling to meet reasonable amenity costs in the public interest. Chalkhill Barn provides evidence in support of this contention. Also, to farmers and advisers alike, it gives a valuable clue as to what can be done, what costs are involved and what costs are reasonable.

For a gross cost (exclusive of grant aid) of about £12,000 the building provides grain drying facilities and a storage capacity of 675 tons. This means a capital cost of nearly £18 per ton of grain stored, a figure which must be assessed in relation to the other functional benefits which the farm derives from the particular design, namely, facilities for intensive beef or young stock production and low maintenance costs attributable to the generally high standard of construction. These complications make it impossible to isolate the true cost of the aesthetic factor by comparing the gross cost with that of a more conventional grain store of similar capacity, but a reasonable estimate may be obtained by other means.

The asbestos encasement below the eaves cost £40, and the additional steelwork needed to give the overhang at eaves and gables resulted in an additional cost of £120. An accurate cost of the additional steelwork needed to obtain the desired proportions of the building is difficult to calculate because so many variables are involved. Nevertheless, assuming high quality workmanship in this case, a figure of about £300 seems to be attributable to the additional work involved in attaining the particular proportions required by the owner. Finally, there is the cost of the cedar boarding and the four-inch curtain walls. This amounts to about £300, and when added to the figures already quoted, brings the expenditure attributable to amenity considerations to a total of £760. If we accept the cost of the walling and boarding as a functional item the cost of amenity may accordingly be reduced by £300 to give a final figure of only £460.

Depending on whether we take £460 or £760 as the proper charge, amenity costs represent either a 4 per cent or a 6.75 per cent addition to the functional cost of the building. Such figures can still involve a farmer in considerable capital expenditure. But additional costs are a very different proposition from the figures of 25-50 per cent which are considered in most discussions on aesthetics, and to many farmers they will be just as acceptable as they were in this instance. Much higher percentage additions have been incurred to far less effect in cases where the problems were less carefully considered and the planning was less meticulous. The success at relatively low cost at Chalkhill Barn must be attributed mainly to the application of some careful

thought at the right time, and to a determination on the part of all concerned to produce an attractive looking building. This is the real lesson to be learned, and it is a lesson worth teaching if we really care about the appearance of our rural landscape.

It is with regret that we have to record that **Norman Hilton, M.A., M.S., F.R.G.S.**, a Senior Research Officer of the Agricultural Land Service Research Group, stationed at Reading, died suddenly on 30th July, 1967, aged 41.

This article, left virtually finished, is a fitting memorial to a respected and gifted colleague.

Sheep Housing Survey

W. A. R. Harris

DURING 1967, the Agricultural Land Service carried out an investigation to help obtain a realistic picture of the sheep housing situation in England and Wales.

The three main objectives of the exercise were to survey the existing methods of housing sheep, to assess structures in use and to draw attention to practical difficulties.

Fairly comprehensive questionnaires, designed to facilitate an objective assessment, were completed by over eighty obliging farmers living in all parts of the country and keeping various breeds at altitudes of anything from 9 to 1,400 ft on farms having an annual rainfall of from 23 to 120 in.

Structures studied varied in complexity and cost from 3s. per sheep for a very simple adaptation using second-hand materials, to £25 per sheep for a more sophisticated and substantial scheme including tower silos and mechanized feeding arrangements.

Housing types examined appeared to divide themselves into three main groups; 'covered' where the sheep were enclosed, 'semi-covered' where sheep had access to an open yard or field, and 'platform' where sheep were confined in an unroofed enclosed area having a solid or slatted floor. Of the housing included in the survey only 3 per cent were of the platform type compared with 80 per cent covered and 17 per cent semi-covered.

It is interesting to note that 42 per cent of the hill farms had slatted floors, whereas only 9 per cent were installed in lowland farms. Indeed, a number of different floor surfaces seemed to be used with satisfactory results. Just over

50 per cent of the solid floors on lowland farms were either earth or concrete with straw bedding. Straw consumption varied from 3 to 4 bales/ewe/winter based on an average housing period of 16 weeks. Other floors were constructed of wood (sleepers) ashes, brick, hardcore, gravel cobbles and various combinations of these.

There was no evidence of any predominance of one type of construction. New buildings were built with wood, steel and concrete frames and had walls of concrete blocks, corrugated galvanized sheeting. Yorkshire boarding, wire or plastic mesh (one or two farmers expressed dissatisfaction with the weather proofing properties of the latter) and various combinations of these. Roofs were generally of corrugated asbestos sheeting or corrugated galvanized steel sheeting.

Adaptations were made in existing stone and slated barns, Dutch barns or lean-tos, using telegraph poles, or other round timber as framing and anything suitable from sleepers to straw bales as walls.

On the hill farms 73 per cent of the sheds surveyed housed ewe lambs or hoggs. On the lowland farms 40 per cent housed ewes and 40 per cent ewes and lambs. This would be expected when the reasons for housing are considered. The majority of hill farmers housed their lambs to avoid the cost of away wintering, while the majority of lowland farmers gave ease of management and better grass conservation as the main reason.

From the figures provided, most of the hill sheds averaged £4 10s. per sheep housed. The lowland sheds averaged £7 16s. This difference will be appreciated when it is remembered that the lowland sheds usually housed ewes who need a larger area.

Apart from cost, 20 per cent of the buildings were wholly or partly unsatisfactory, either from the farmer's point of view, that of the A.L.S. investigating officer or both. Forty-five per cent of the unsatisfactory cases were due to poor ventilation, forty per cent had inadequate feeding arrangements, namely poorly designed and constructed troughs and racks, shortage of trough space, and poor access to troughs and racks by the farmers. It is interesting to note that two farmers practised on-the-floor feeding and one farmer self-feeding of silage with apparent success.

The remainder had difficulties (due to absence of pen divisions) which led to poor mothering at lambing time and bullying. In two cases poisoning had occurred when sheep had access to copper piping. It would seem that most troubles are experienced in existing buildings not adapted properly or buildings not suitable for conversion.

However, the majority of farmers expressed satisfaction with their buildings both from the functional and structural aspects. The survey confirmed that many combinations of structural materials can be used satisfactorily provided they are used to conform to accepted principles of design which are desirable for efficient husbandry.

Adequate ventilation, draught-free and clean lying areas, good feeding and watering facilities and labour saving handling arrangements would be the basic requirements for any successful sheep housing system.

This article has been contributed by **W. A. R. Harris, Dip. Arch., A.R.I.B.A.**, who is a Senior Assistant Land Commissioner (F.B.A.O.) with the Headquarters of the Welsh Department at Aberystwyth.

Sir William Gavin

1886—1968

SIR WILLIAM GAVIN, who died on 4th June, had been for many years a familiar and distinguished figure in agricultural circles.

Agriculture had been his main interest and concern from his days at Cambridge, where he took an agricultural diploma, until the end of his active life. In the years between the two wars and again after the last war he was for the most part engaged on the agricultural side of I.C.I. He also fitted in a number of other tasks—for example, as a Governor of Lord Wandsworth College, a Director of the Agricultural Mortgage Corporation, a member of the Royal Commission on Scottish Affairs and Chairman of the Jamaica Banana Commission. But for most of us he will be remembered mainly for his prominent part in the war time food production campaigns—especially, of course, that for 1939–45 when he was the Minister's Agricultural Adviser and Chief Liaison Officer.

The campaign on the food front in the last war was a tremendous team effort and an important feature of it was the organization of County War Agricultural Executive Committees. The working of this machinery was greatly helped by the appointment by the Minister of a number of personal Liaison Officers whose job was on the one hand to interpret and explain the Minister's policy to the 'War Ags', and on the other, to keep the Minister closely informed of opinion in the counties, the progress of the campaign and any local difficulties.

In leading this group of officers, each of them of the highest standing and influence in his area, Gavin's personality, knowledge and great experience were quite invaluable. He established and maintained a spirit of understanding and co-operation all round, not least between County Committees and senior officials in Whitehall. He it was who supplied much of the oil that made the machine run smoothly, where there could so easily have been serious friction.

Bill Gavin always had an infectious enthusiasm for the job on hand and there must be many who count it a privilege to have worked with him.

RICHARD MANKTELOW



*Spring time in the Waikato region
of North Island*

Large Dairy Herds

in New Zealand (1)

J. F. Usher

THE majority of New Zealand's thirty million acres of agricultural land is in grassland, the 'Green Gold' of New Zealand. Grass is the basis of the country's prosperity, since over 90 per cent of total exports come from the land in the form of dairy products, meat and wool.

Dairy paradise

The main dairying areas are in North Island. Regions such as the Waikato and Taranaki are renowned for intensive low-cost milk production from grassland, and have been called the 'dairy paradise' of the world. Due both to the very favourable maritime climate and adequate applications of phosphate and potash, good pastures in these regions produce 12,000 lb of dry matter per acre from clover nitrogen only, and have a potential stock carrying capacity of 1½ Jersey cows per acre, without concentrates or other purchased supplementary feed. At this level of stocking, average cows and good management can produce at least 500 lb of butterfat per acre or the equivalent of 1,250 gallons of 4 per cent butterfat milk per acre without concentrates. Several leading farmers have already reached these very high production levels, first pioneered at the famous Ruakura Agricultural Research Station, near Hamilton.

Low cost

The New Zealand dairy industry is based on low-cost summer milk production from grassland. Milk is sold on a butterfat basis and over the last few years total payments to factory supply farmers, i.e., those producing

milk for manufacture, have averaged a little over 40d. per lb of butterfat including returns from the non-fat by-products of the butter and cheese manufacturing processes. Equivalent to 1s. 4d. per gallon of 4 per cent butterfat milk, this is a very low price by British standards and is the main determining factor behind the New Zealand philosophy of low-cost intensive production. Average herd size throughout New Zealand is 80 cows compared with under 30 for England and Wales, and during the last five years there has been a significant swing towards more cows per acre and per man. Large herds in New Zealand are a reflection of the low milk price, and the fact that New Zealand, unlike Britain, has very few small farms.

Share milking

A typical North Island dairy farm is about 100 acres, usually all permanent pasture, and carries a herd of 100 Jersey cows plus followers. Stocking rates of one cow per acre plus replacements are common, representing 1.2 Jersey cow equivalents per acre. One very soon becomes accustomed to talking about cows per acre rather than acres per cow! This size unit is a family concern, generally no permanent labour is employed, and the farm will be run by an owner/occupier or share milker. In the Waikato region approximately 25 per cent of all dairy holdings are run by share milkers, and for many years this form of partnership has proved very successful. The usual form of contract is a 50 per cent agreement whereby the share milker provides the herd and farm machinery, and is responsible for all farm operations, in return for which he receives half the butterfat cheque, plus a proportion of any additional income such as bobby calves. The owner provides land and buildings, and is responsible for fertilizing and maintenance of fixed equipment. At the present butterfat price of 40d. per lb a good 50 per cent share milker with a herd of 100 cows has an income of around £2,000 per year, having paid his full share of farm costs. He will normally live in the farmhouse, rent free, the owner having moved to another house on the farm or purchased a property in a nearby town. The aim of most share milkers is to build up sufficient capital to take out a mortgage on their own farm. There are many farming ladder success stories in New Zealand, relating to those who started by share milking. However, due to the ever-increasing capital requirement to purchase and stock a dairy farm, the first rung of the farming ladder is becoming increasingly hard to reach.

The selling price of land is based partly on its butterfat production at the time of sale, and a high-producing dairy farm, reasonably well situated in relation to towns and social amenities, will sell for not less than £200 per acre, and often up to £300. However, an ambitious share milker looking for a farm will try to buy a run-down property at £150 per acre or go into a newly-developed area where prices will be nearer £100 per acre, because farms may be isolated or present stock carrying capacity under one cow per acre.

High labour productivity

There are several reasons why labour productivity is so high on New Zealand dairy farms, but most important is that units are highly specialized and are efficiently geared up for intensive milk production. They are cow keepers in the true sense of the word, and put all their resources into producing

as much milk per acre as possible. Contractors are employed for spreading fertilizer, making hay and silage and also miscellaneous jobs, such as hedge cutting and ditching. Their charges are higher than in Britain, for example, hay baling costs about 1s. per bale, but this is generally the cheapest way of getting the job done, since with the farmer having such a large herd the alternative is to employ a full-time man, and on the family unit of 100 acres and 100 cows, he is not justified throughout the year. Casual labour is very hard to find.

Thanks to the North Island climate which ensures prolific grass growth for nine months of the year, forage conservation requirements are low, being only 10 cwt of hay or 30 cwt of silage per cow per winter. It is seldom necessary to house cattle in winter due to the mild climate and free-draining soils in many areas, and this again reduces the labour requirement. Little or no ploughing and re-seeding is necessary since under good management a perennial ryegrass white clover sward has an indefinite life.

Paddock grazing

Paddock grazing is the main form of grassland utilization, and it is no exaggeration to say that all dairy farms are now operating this form of grassland management. The system is very simple, the farm being split into about twenty equal sized paddocks for twenty-four hour grazing, or forty paddocks for twelve-hour grazing. The 'two sward system' whereby one area of grassland is used mainly for cutting, and the other for grazing, is not practised largely because of the low conservation requirements.

An important part of the paddock grazing system is the farm 'race' or access passage to the paddocks. For a herd of 100 cows this is usually 12-15 ft wide and unless the soil is very free-draining, it is re-inforced with a 6 in. layer of hardcore, using a finer textured material at the top to avoid foot troubles. The race is 'crowned' or raised in the centre so that water drains off readily and puddles cannot form. This operation is carried out at least once a year, usually by the farmer himself, using a rear-mounted tractor grader blade.

Slow rotation grazing

During the three-month winter period covering May to August, grass recovery is very much slower, and a system called 'slow rotation grazing' is practised. The principle here is that to provide the herd with a fresh break of reasonable quality grass each day, it is necessary to slow down the grazing rotation to match the speed of grass recovery. At certain periods in winter, this can be as long as 90 days, so that each day's grazing area is restricted to the extent that it would take the herd 90-100 days to go around the whole farm. This is achieved by block grazing within a paddock by means of a front and back electric fence, so that the cows are in fact strip grazing. Hay and/or silage is fed on the grazing block to supplement the limited amount of grass available, and cows are made to graze very closely. The effect of this close grazing is to encourage perennial ryegrass dominant swards. The system is very flexible since the daily grazing area can be adjusted according to the amount of grass available. During wet periods in the winter, grass will grow but it lies dormant in frosty conditions when near ground temperatures can drop to 15-20°F (-9.4-6.7°C). However, fairly strong sunshine usually follows a frosty night and this stops the soil freezing.

Although climatically New Zealand dairy farmers have an advantage compared with their counterparts in Britain, on average they are still making much better use of grassland by means of paddock grazing and high stocking rates.

'Topless' cubicles

The slow rotation system of winter grazing is obviously only suited to free-draining soils, and to avoid poaching on very heavy soils it is usually essential to house during June and July. Cow kennels suit the New Zealand approach to low-cost farming and are proving very satisfactory. 'Topless' cubicles are the latest development in low-cost housing, and are simply uncovered cubicles with a concrete passage. It should be appreciated that cows are dry during the winter period when they are housed, and temperatures are relatively mild by our standards. Other systems of in-wintering commonly used on heavy land are sawdust pads and covered barns. The sawdust pad also has a place in 'slow rotation grazing' where it can be used to contain the herd for a few days during very wet weather.

Concentrates cost about £35 per ton or nearly 4d. per lb and are not generally economic in relation to the milk price of 1s. 4d. per gallon. At average stocking rates of one cow to the acre they are only used if grass is very scarce in the spring at the beginning of lactation. However, as stocking rates approach two cows to the acre they may be economic, providing they are only fed at low rates to maintain yield during periods when grass growth is insufficient to meet maintenance and production. Ruakura are now experimenting with the use of concentrates or other supplements at ultra-high stocking rates.

Part 2 of this article will appear later and will cover profitability and the management of large dairy herds

John Usher, N.D.A., N.D.D., is the N.A.A.S. District Agricultural Adviser for the Wincanton district of Somerset, an area almost entirely devoted to milk production. Last September he returned from a twelve-months exchange visit to New Zealand, where he was a Farm Advisory Officer with the New Zealand Department of Agriculture, and spent the majority of his time in Matamata, one of the most intensive dairying areas in New Zealand. Trained at Harper Adams and Seale-Hayne Agricultural Colleges he joined the N.A.A.S. in 1961 and was an Assistant D.A.A. in Buckinghamshire before moving to Somerset in 1964.

Horticultural Buildings Pocket Book

This pocket book, published by the Ministry of Agriculture, Fisheries and Food, sets out, in a practical way, recommended standards for new and existing buildings and other fixed equipment used by the horticultural industry.

In this first edition the aim has been to set down what are regarded as the more important requirements of the present day needs of the industry.

Copies may be obtained from Her Majesty's Stationery Office, P.O. Box 569, S.E.1., Government Bookshops (addresses on p. 406) or through any bookseller, price 3s. 6d. (by post 4s.)

Wastes from the Poultry Industry

C. T. Riley

We hear nowadays of the importance of conserving and re-using waste materials. This article endeavours to define some of the waste materials that are normally produced by the poultry industry and these are briefly discussed with their relative importance.

From the standpoint of the agricultural industry it must be remembered that in some form or other all these wastes have to be absorbed into the air, land, rivers etc., of the whole country. At the same time the community itself is producing much larger volumes of waste and, therefore, reluctant to accept more from other industries. (It is interesting to note that in the United States of America the total waste amounts to something like one million tons per day.)

Hatchery waste

This is a mixture of condemned cockerel chicks, dead in shell, incubator fluff and shells from chicks which have hatched. Several useful papers have been published on both sides of the Atlantic on the re-use of this material. Clearly it would be better combined with a mixed waste meal than offered on its own, and the product would be improved if it included day-old cockerel chicks, but this is not always possible. The major difficulty is, of course, the increase in calcium from the shells of chicks which have hatched. If it is possible to remove these shells from the hatched chicks and treat the residue then a protein level of up to 36 per cent may be obtained.

Some of these wastes are absorbed in various industrial processes but they do not represent a significant income to the farmer producer.

Manure from growing stock

Probably the best estimate of quantities here is based on the feed input of the bird; in other words, a growing pullet will produce roughly the same quality of faecal matter at 70 per cent moisture as its actual daily food intake. This has an extremely high nitrogen and valuable protein content, particularly where cage rearing is involved. The level of protein may be as high as 40 per cent. We can also note that in many cases it is much drier than the manure from layers, especially where cage rearing is practised.

Manure from cage layers

Here we can expect to receive about one ton per 1,000 birds per week, that is about 30 cu. ft, 200 gallons, or just over a cu. yd at approximately 70 per cent moisture, and weighing 65 lb per cu. ft.

There is considerable interest in this product from the point of view of thermal drying or dehydration and serious attempts are being made to dry the cage manure and produce a fertilizer for both general and specialized uses. It is extremely difficult to estimate the value of this manure but, if we take it as 20 : 10 : 10 units of N, P_2O_5 , K_2O per ton of manure, and charge these nutrient units at 8d., 6d. and 4d. per unit respectively, then we have a value of 14-3d. per bird per year (and this has allowed for substantial value reductions due to leaching etc.). A case can be made out for a considerably higher figure than this.

Some work is proceeding on the re-cycling of this poultry manure nitrogen to ruminants as a source of protein. If the indications are successful then the waste could, under some circumstances, be worth more than the eggs.

It is very much apparent that new design techniques for handling manure will markedly affect the design of the layers house in the course of the next few years.

Manure from layers on litter

Deep litter layers will produce in the region of 30 tons per annum of a mixture of faecal matter and litter for every 1,000 birds. This is probably the waste which shows the greatest variation both in fibre and moisture content. In general it is fairly easy to handle, and as this is necessary only once a year it does not normally present a disposal problem, except in particular local conditions.

Manure, deep litter from broilers

This is usually a mixture of sawdust and/or shavings plus faecal matter from young growing chickens. The product is worth seriously considering because it is the most easily handled and friable manure from the point of view of spreading, and it carries the highest normal nitrogen analysis of any agricultural wastes. The high nitrogen level is, of course, related to the high protein feed input of the fast growing broiler and thus the litter product is really a material well worth considering. It is being used freely as a fertilizer and does not present a general disposal problem. In the U.S.A. some sound experimental work has been done in feeding this high nitrogen litter to ruminants, notably bullocks, and with some degree of success. This attempt to re-cycle the waste nitrogen could eventually be of some importance, particularly perhaps in developing countries. It is clear, however, that there are difficulties involved; for example, the moisture and the fibre content of the litter are of the greatest importance and there can, of course, be a risk of passing pathogens from the litter to the ruminants. Such a project needs very careful assessment.

Using quite conservative N.P.K. analysis data it can be demonstrated that the litter per broiler per crop is worth between 1d. and 2d. per bird depending on the type of assessment used. This could be of value to a broiler unit but little is actually sold; usually the litter is given away.

Feathers and offal from broilers

Here again there is a possibility of between 1*d.* and 2*d.* per bird from this waste material which goes to make protein feed, fertilizer and other items for both agriculture and industry.

Poultry packing station washings

This is not a waste that affects a great number but where packing stations are processing poultry the washdown water from these units can be difficult and expensive to dispose of. There are, however, signs that the use of modern public health engineering techniques in this connection can satisfactorily solve these problems at a reasonable cost.

Do the pennies matter?

We have thus looked at some wastes and mentioned in passing that there was a penny here and a penny there if the farmer producer was able to obtain it. If, for example, we take the 14·3*d.* from the cage layer's manure and add to it the 1·7*d.* received for offal this is an item of 16*d.* per bird which, if it is in fact cashed, is not a receipt to the farmer producer.

It can be argued that 16*d.* per bird or 1*d.* or 2*d.* per carcass is of no account in the overall economics of the laying hen. This may well be true but if, for example, we look at the feather and offal waste from broilers, this item cashed in at £40 per ton equals 1*d.* or 2*d.* per bird and represents a very much higher return on capital (i.e., capital that has been spent on the processing unit for these wastes) than is normally obtained on broilers. Such a unit could well show 50 per cent per annum on the capital.

Thus in the right context these wastes may have a significance which many producers do not realize. Nevertheless, a few farmers and some farming groups appear to be making serious, if quiet, investigations into this new waste disposal discipline. Time will show whether the search has been successful.

This article has been contributed by C. T. Riley, N.D.P., who is a specialist in poultry waste disposal with the National Agricultural Advisory Service at Guildford, Surrey.

Mr. Percy Izzard, O.B.E.

Mr. Percy Izzard, the noted agricultural and horticultural journalist who died recently at the age of 90, was always a good friend of the Ministry of Agriculture. During the last war he travelled all over the country on the Ministry's behalf addressing large audiences on the highly successful 'Dig for Victory Campaign'. For his services he was awarded the O.B.E.

Nostell Priory in the West Riding of Yorkshire and the Appleby Estate in Lincolnshire have been the homes of the Winn family for over 300 years



Nostell Priory and Appleby Estates

G. E. M. Hildred

THE Nostell Priory Estate lies in the West Riding of Yorkshire, astride the A.638 trunk road, six miles south-east of Wakefield in the triangle Wakefield/Pontefract/Doncaster, whilst the Appleby Estate is five miles east of Scunthorpe in Lincolnshire.

The Nostell Estate is situated on coal measures and gritstones with all the variations of soil types this implies. Nostell itself has heavy to medium loams in an undulating well-wooded countryside interspersed with large grass and arable acreages which is pleasant to the eye. Industry only shows fitfully in the form of colliery pitheads and slag heaps. The farming policy of the locality is dairying with arable cultivation on the better drained soils where corn, potatoes and food for the dairy herd are grown.

From this it may be gathered the Estate has an industrial and coal mining backcloth, the latter having played an important part in its history. The Estate, which comprises 2,671 acres, has been in the hands of the Winn family since 1654 when it was purchased by one Rowland Winn, an Alderman of the City of London. However, centuries before the Winns came to Nostell,

a priory was in existence which was dedicated in the twelfth century in honour of St. Oswald, the martyr King of Northumbria. The friars worked industriously under a succession of 37 priors, even undertaking opencast coal mining until the dissolution of the monasteries, during 1536-39 in the reign of Henry VIII. Three separate ownerships then followed until 1654. Succeeding generations of the family have exercised the highest standard of progressive stewardship over the years, both at Nostell and on the 4,514-acre Appleby Estate. The Winn in possession at the time of the Restoration was created a Baronet and this title remained in being until the death of the sixth baronet in 1805 when the property passed to his nephew, John Williamson, who took the name of Winn. He, in turn, was succeeded by his brother whose son, Rowland Winn, became Chief Whip in the Disraeli Cabinet and was created Baron St. Oswald in 1885, taking the title from the Northumbrian King.

The present Baron has had an adventurous career, being the *Daily Telegraph* correspondent in the Spanish Civil War during the 'thirties, when he was, at one point condemned to death in 1936. He had a military career throughout the Second World War during which he was twice wounded and mentioned in dispatches, and subsequently spent a year as a volunteer in Korea being awarded the Military Cross and two Belgian Decorations. He took over the Estates in 1953 and became Lord St. Oswald on the death of his father in 1957. He was Parliamentary Secretary (Lords) for Agriculture from July, 1962, to October, 1964. At the time of his inheritance the present Lord St. Oswald, in conjunction with the Trustees, handed over to the National Trust the mansion and 25 acres of pleasure grounds, including one of the three lakes, these having been open to the public during the summer month previous to this date. The number of visitors has steadily increased over the years and this year exceeded 50,000.

The house is Georgian and building was commenced in 1733. The Baronet of the day took nineteen year old James Paine under his wing and started his architectural career by sending him to see Palladio's villas near Venice in Italy and, as a result, the young Paine decided to draw up plans based on the Villa Mocenigo, which was never built. A central block linked by corridors to two southern pavilions was erected. During the building, fashions changed, Paine's designs were halted and, as a result, the two northern pavilions were never built. The master hand of Robert Adam now took charge and he designed a new north and south wing and extensively altered the internal decorations of the house. The wing to the south to balance the composition was never constructed. His now world famous team of craftsmen included Joseph Rose, who was responsible for the stucco work, and Antonio Zucchi, who painted the ceilings and murals, while the latter's wife Angelica Kauffmann, contributed a number of pictures. The most successful of English cabinet makers, Thomas Chippendale, worked hand in hand with Adam to produce the fine furniture which still stands in the places for which it was designed. The fixtures and furniture are still the property of Lord St. Oswald.

Both the estates at Nostell and at Appleby had hardly changed in size or character until 1947, when nationalization of the coal industry caused a coal mine, Nostell colliery, and a brickworks to be transferred. Subsequently the brickworks were repurchased and after recent modernization are now a thriving undertaking with a weekly production of about 300,000 bricks. The whole Estate, as will be seen, has been linked with mining for a very long

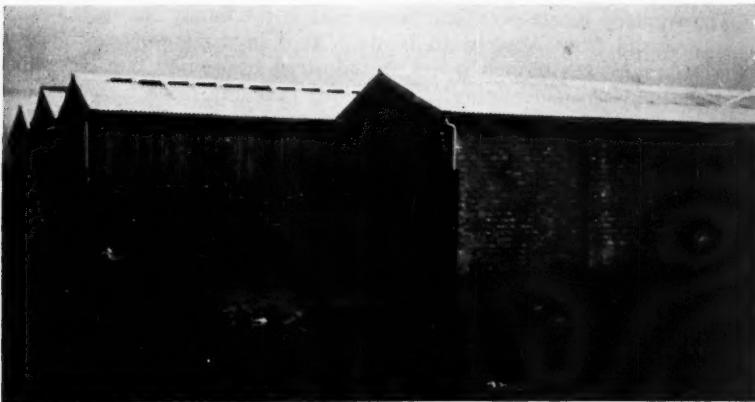
period, the resultant subsidence over the years being a major problem. The mansion, church and bridge over the lakes on the A.638 are resting on pillars of coal and some 500 acres of the Estate have been subject to opencast coal working. None, however, is being worked at the moment though 80 acres are still waiting to be handed back when the drainage problem has been solved.

In the last few years all the cottages on the Estate have been modernized, hot and cold water, together with a bathroom, being provided in each. Estate maintenance is carried out by an estate carpenter with two apprentices, and a mason and his mate; a fully equipped joinery shop is also available. The walled garden, staffed by a foreman and two men, is run on a commercial basis for the sale of roses and shrubs. The agent, G. M. V. Winn, Esq., F.R.I.C.S., cousin of the owner, has an office staff of two at Nostell and an assistant on the Appleby Estate.

The Estate is made up of twelve tenanted farms, the Home Farm and woodlands. The woodland comprises 152 acres of hardwoods devoted to amenity, with an archery course incorporated in one of the woods and the South Yorkshire Field Archery Association use it for practice. Maintenance of the woodlands is the responsibility of the Home Farm Manager under the direction of the Agent, the chief problem here being pollution from surrounding industry. The shooting is in hand.

The twelve tenanted farms range in acreage from 5 to 420 acres, six being from 176 to 420 acres and the other six from 5 to 132 acres. Farm size has been in the forefront of the Agents' mind over the last decade at Nostell and thus improvement of fixed equipment was concentrated on the larger acreage units, with amalgamation of the smaller units to be undertaken when circumstances permit. This policy has led to Farm Improvement Schemes being grant aided to date on four holdings. The Estate policy has been to provide general-purpose type buildings and corn storage which has already been done on three of these farms. One unit, the largest on the Estate, was created by combining two farms to form a 420-acre unit and on this a large scale improvement has been undertaken to provide a completely new dairy unit for 160 cows with a new covered area 80 ft by 180 ft in timber and

Cattle housing at Huntwick Grange Farm



asbestos. In addition, an existing cowshed has been converted to form a collecting area, 16-stall 8-unit herring-bone parlour and dairy with a 500 gallon bulk milk tank. Provision of grain storage has also been made in the form of a 2½ ton per hour drier and on-the-floor storage. It is interesting to note that the dairy herd is being kept on zero-grazing with supplemented barley feeding—such a system being particularly useful for this holding as most of the original grazing was subjected to opencast mining and this obviates excessive poaching by the stock.

The Home Farm comprises 450 acres, 91 of which are parkland used for grazing as well as car parking for visitors to the house, the village cricket ground, country fair and village festivities. The holding has a 70-cow Ayrshire milking herd with appropriate followers, some 270 acres in corn, wheat and barley, 40 acres of potatoes and 40 acres in one-year ley for silage.

Since the war great efforts have been made to increase the efficiency of the unit and, over the years, economy of effort and increased profit have been obtained by simplification. A beef herd has been sold and the growing of oats and peas banished from the rotation. The dairy herd has increased from 35 to 70 cows, the barley acreage has increased fourfold and the potato acreage doubled. To meet this change considerable improvement to buildings was needed and this necessitated a great deal of thought as any alterations or new buildings would have an adverse effect, not only on the beautifully built stone buildings erected by the Winn family, but also on three relics of the monastic days, the old refectory, the pigeon cote and the monks' brewhouse. The old refectory had previously been converted into a cow-house and slaughterhouse and the brewhouse had been used as a store. These old buildings, which are too good to demolish, did not readily lend themselves to modern use. Eventually it was decided to convert a Victorian stone building to an 8-stall, 4-point herring-bone parlour and dairy, the other end of this building being adapted from a horse stable to a potato chitting house and an existing Dutch barn converted for grass silage.

The Paine and Adam stable block standing about 300 yards from the other farm buildings was utilized for grain storage purposes. Here a four ton an hour drier, together with 100-ton capacity bin storage, were installed whilst the old coach house and the riding school were converted for on-the-floor bulk storage to accommodate the remaining tonnage. The stable block is also used as a motor cycle museum and a tea room, unaltered loose boxes being used for this purpose.

The Appleby Estate near Scunthorpe was in the family before 1654 (the family spread from Appleby to Nostell). It is in many ways a complete contrast to Nostell though it has an industrial connection like Nostell in that the underground mining of iron stone is taking place below a large section of the Estate. The original hall at Appleby was burnt down over 40 years ago and no family house is now available.

Soils on the Estate are very diverse ranging from limestone and variable loams to blow away sand, the latter carrying the woodlands. There are six large farms varying from a minimum of 380 acres to 749 acres, all of which have modern farm buildings for arable farming and 1,000 acres of commercial woodland comprising both soft and hardwoods 700 acres of which are dedicated under the Forestry Commission scheme—a foreman and three men being responsible for the maintenance.

Appleby village itself was built as a model layout by the first Baron St. Oswald and the cottage design and village layout was exhibited at the

Great Exhibition during the last century as a model of a typical English farming village of the period.

Over the last 300 years the Estate has adapted itself to the circumstances and problems of the times and now in the twentieth century it is successfully meeting the demands of the present agricultural revolution.

This article has been contributed by **G. E. M. Hildred, F.R.I.C.S., A.A.I.**, who is a Senior Assistant Land Commissioner with the Agricultural Land Service in the Yorkshire (West Riding) Divisional Office.

Forecasting Pigmeat Production in France

R. C. Rickard



PIG production, perhaps more than any other type of production, is plagued by wide fluctuations in prices. For instance, there are the short-term day-to-day fluctuations which may be induced by variations in supplies and demand. There are also regular seasonal patterns of pig prices, due mainly to the natural breeding pattern of pigs but also partly to differences in demand levels. Furthermore, patterns of production and demand can be spasmodically distorted by extraneous factors, such as an outbreak of disease or sudden changes in the supply of other forms of meat. It is generally asserted, however, that the variety of factors fails to remove the familiar persistent cyclical fluctuation in pig production.

Pigs have a relatively short production cycle of from ten to twelve months, of which four are the gestation period. Production is also relatively independent of land. The combined effect of these two factors has resulted in a considerable degree of fluctuation in the supply of pigmeat over many years.

The well known term 'pig cycle' is used to describe a regular upward and downward movement of supplies and prices which occurs in all countries where pigs are produced for a free market. One-and-a-half to two years of high prices and short supply are followed quite consistently by a similar period of plentiful supply and low prices.

Many different measures are used to counteract the chronic instability induced by the pig cycle. Their success is claimed to be very largely dependent on the effectiveness of production forecasts. These forecasts may be of considerable value but they do not provide the complete answer to seasonal and irregular fluctuations. For instance, they cannot make any important contribution in correcting purely short-term variations in supply and price which frequently occur in the markets. Such variations are chiefly caused by the organization and structure of the markets and, therefore, can only be eliminated by improvements in that direction.

Despite their shortcomings, an attempt was made in France in 1957 to use production forecasts based on data collected from a limited number of farms. The results were not sufficiently reliable and this method was discontinued. A 'Service for Studying and Forecasting Pig Production' was introduced in 1962. This Service was originally attached to the 'Société Interprofessionnelle du Bétail et des Viandes' (S.I.B.E.V.) but later, at the beginning of 1965, came under the control of the 'Central Service of Statistical Enquiries and Studies' of the Ministry of Agriculture which assumed sole responsibility for the collection of statistics on pig production. Now, forecasts of production and supplies of pigmeat in France are derived from three principal sources: (1) short-term forecasts; (2) annual surveys of the structure of pig production and (3) statistics on pig slaughterings.

Short-term forecasts

There are, broadly speaking, two methods which can be used in making short-term forecasts (i.e., several months ahead). The first consists of taking stock at regular intervals of the numbers of pigs of different categories in herds. In practice, counts are made every three or four months, at intervals not exceeding the sow's gestation period. The second method makes use of data relating to change, or 'flow' over time. Services or farrowings are recorded immediately they occur. Then, by taking into account such factors as ineffective services, piglet losses and mortality, the data on services or farrowings can be used to predict the likely level of slaughterings eleven to thirteen months, or seven to nine months, later.

In France, the recording of services or farrowings was chosen for the following reasons. It is cheaper and easier to carry out, and this was especially important at the time in view of the personnel available. Moreover, it is possible to make longer forecasts of approximately eleven months compared with three to eight months for the alternative method.

Two kinds of survey are used to obtain information. The first is directed towards producers keeping so-called 'public' boars, which are mainly available for service other than in the boar owner's herd. The second survey concerns producers who keep 'private' boars, which are usually kept for service within the producer's own herd. A sample of five per cent of the parishes is drawn in each department, and producers are supplied with books for sending information.

Owners of boars used mainly on sows outside the owner's herds are supplied with a book of service sheets. The identity of the boar and the sows, breed and date of service are recorded on these sheets. In addition, two supplementary questions are asked. One is intended to distinguish between first services, and first and second returns to service. Third returns are considered unimportant and are included, when they occur, with second returns. The second supplementary question deals with the previous litter produced by the sow being served—date of farrowing, the number of the litter (i.e., the sow's first, second or third, etc., litter), the number of pigs born alive and the number weaned.

Pig keepers with private boars are supplied with a book of farrowing sheets. With private boars, it will be realized that it is extremely difficult to obtain precise information on services. The questions here, therefore, are concerned with the farrowings of sows served by such boars, including those outside the particular herd to which the boar belongs. The number of piglets born per litter, however, takes no account of pre-weaning deaths. Figures for such losses are derived from information provided by producers keeping public boars and later corrected if the performance obtained by producers using their own boars is found to be different from that obtained by producers having recourse to public boars.

Annual survey into structure of herds

The first national survey of the structure of pig production was undertaken in April, 1966. A stratified sample was drawn and, on average, one in every hundred pig herds was investigated. This first survey was particularly comprehensive and included sections on types of building, methods of feeding, pig numbers on hand at a given date, monthly slaughterings of pigs for farm consumption and many other details such as the culling of sows and the ages of piglets at weaning. The intention is to hold a similar full survey every three years and two shorter ones during the intervening period.

The annual survey is intended to serve other purposes as well as the particular requirements of the forecasting service. As far as the latter is concerned, information is provided on the number of animals slaughtered for farm consumption which, together with off-farm marketings, enables the total volume of production to be estimated. Samples of producers keeping boars can be drawn for specific enquiries such as an attempt to calculate a correcting fraction for use where producers are thought to have underestimated their returns. Additional information can be obtained on the number of animals retained for breeding, the proportion of sows culled and losses during the fattening period. All this information is necessary in processing the results of the service and farrowing returns.

Statistics on slaughterings

The number and tonnage of commercial slaughterings are published monthly. The municipal and private industrial slaughterhouses are obliged to declare their killings by number and weight to the veterinary authorities. Non-recorded slaughterings at private slaughterhouses, which amount to about twenty per cent of the total, are assessed at local level. Statistics of foreign trade provide details of live pigs imported and exported, both in numbers and weight.

After taking account of farm consumption, information regarding which is obtained from the annual survey of the structure of the industry, it is possible to arrive at an estimate of the monthly volume of production both in terms of number of pigs and tonnage. By comparing the trend in the number of sows served with the production statistics, the average age of pigs at slaughter can be estimated and this figure can be verified by the structural survey.

Forecasting pig production

To summarize the foregoing information a table of factors used to forecast pigmeat production from the returns obtained from producers keeping boars is given in the following table, together with the source and frequency of the various factors.

Factor	Source	Frequency
1. Number of services	B	Monthly
2. Percentage of effective services	B and P	Monthly
3. Piglets born per litter	B	Monthly
4. Pre-weaning deaths	B	Monthly
5. Percentage of animals retained for breeding purposes	P	Annually
6. Percentage losses during fattening	P	Annually
7. Age at slaughter	B, P and S	Annually and Monthly

B. Returns from producers keeping boars.

P. Survey of the structure of pig production.

S. Statistics of slaughterings.

Some countries in Western Europe have been developing their systems of forecasting pig production over a number of years. The forecasting method used has in some instances been dictated by the available statistics. Many of these statistics were developed at times when the importance and requirements of forecasting were not clearly recognized. Other countries have closely co-ordinated the collection of statistics with the method of forecasting employed. The system adopted in France is particularly interesting because, until very recently, there were few detailed statistics on pig production. It is as yet too early to judge whether the surveys being carried out are likely to prove effective in the future. Much of the information is undoubtedly in a somewhat crude form and some refinement will be needed in the years to come. However, results already obtained have given rise to optimism concerning the eventual likelihood of success.

The author of this article, R. C. Rickard, B.Sc. (Econ.), is a lecturer in the Department of Agricultural Economics, Exeter University.

Experimental Husbandry Farms

The series of articles from the Ministry's Experimental Husbandry Farms will be resumed next month.

The 22nd Oxford Farming Conference, which was to have been held in January, had to be cancelled in view of the foot-and-mouth epidemic. Because of the importance of the topic chosen for the Conference, the decision to publish the papers in book form will be widely welcomed

Land — Use or Abuse?

S. R. O'Hanlon

THE working party of the Agricultural Research Council in a report published in May, 1967, focused attention on the fact that in thirty years time Britain might require at least twice the present net output of home-grown food, and stressed that this rate of growth would require 'quite exceptional efforts by farmers, advisory and research workers, and many changes in traditional methods of agriculture'. This is at once the crux and the theme of the problem which was discussed by the contributors to the 22nd Oxford Farming Conference.

Population pressure

The old pattern of town and country as separate entities of interest and working activity is fast being effaced under the pressures of an increasing population which not only demands to be fed, but fully administered to in the matter of housing, new centres of industry, fast roads and all the amenities of a society that finds itself with a great deal more leisure than earlier generations ever knew. These are 'the teeth gnawing away at our farm acres', as Mr. Philip Bolam expressed it. The estimated population increase in Britain, from its present 54½ million to over 60 million by 1980 and between 70 and 75 million by the end of the century is a problem that must be dealt with *now* by careful planning and consultation at all levels. The very tightness of our small island must ultimately set a limit to what can be done to satisfy all competing demands.

Mr. G. T. Williams pointed to our existing average population density of 588 persons per square mile of land, even including mountains and moorland. He compared it with India, universally regarded as a densely populated country, where the corresponding figure is rather less than 400 per square mile. Excluding rough grazings, he said, there is under 0.6 acres of farm land per head, and notwithstanding the revolutionary increase in agricultural productivity during the past thirty years, if we continue to lose land at the rate of 50,000 acres a year, we shall by the end of the century have only 0.45 acres of farmland per person. 'Once the land is taken for urban or other non-agricultural development, it has virtually ceased to be of any value for food production', said Mr. Williams. 'We may be able to take a relatively complacent view of the present rate of annual loss—although every nine years this represents an area the size of Oxfordshire—but unless we plan now to use our land in an intelligent way, we shall be taking an unwarranted and irresponsible risk with the basis of this country's food supply'.

Professor Wibberley pointed to the progress of urban development in England and Wales since 1900, when about two million acres were used for urban purposes; by 1960 the acreage had doubled and by the year 2000 it is likely to be some 5–6 million acres. But he anticipated no major change in the existing *selective* expansion of urban acreage. 'The North West, the Midlands and the South East in particular, will become increasingly metropolitan in character, whilst parts of the South West, Wales, the North and even the East will stay strongly rural, even at the close of this century. This means that farmers in the metropolitan areas will have to accept cities and towns close to them and large numbers of people wanting to travel past or across their farms'.

Farming in the midst

This implies the need for a new attitude by farmers who find themselves more closely integrated with urban life and the 'play grounds' that are opened up to its increasingly mobile inhabitants. So much of modern life is conditioned by the internal combustion engine. Professor Wibberley looked with confidence to the continued agricultural productivity, already so well marked, to redress the inevitable losses in farmland, provided that, amongst other things, urban expansion is reasonably selective in avoiding the top grade tillage soils where increases in yields are high, costs are low and farming adaptability is good, and that the development of outdoor recreation is guided away from agricultural production on the better lands.

Since the Industrial Revolution urban growth has coalesced around the centres of raw materials and consequential factory development. Outside these areas the former 'simple hierachial pattern', to use Professor Lichfield's words, had an agricultural basis—numerous small market towns spaced at distances of 20–25 miles and the towns fulfilling essential functions, servicing the rural population. Today the concept has radically changed, and the 'city-region' has developed, based on the recognition of the close linkage between the urban built-up areas and the surrounding countryside. 'The journey-to-work linkage, recreational linkage, service centre linkages were all recognized', said Professor Lichfield. 'The common facilitator was the motor vehicle, especially the motor car. People living in rural areas were increasingly able to travel into towns, townsfolk to travel out. No longer was the movement limited to areas around railway stations'.

Less land from which to produce more food for a larger population inescapably means more intensive production, and it was on the essentially technological aspects confronting farming that Mr. Bolam concentrated. His was something of a critical approach, highlighting a few of what he felt could be limiting factors in securing the extra increments, whether deriving from husbandry practice and business management on the one side or the likelihood of changes in consumer demand on the other.

Regrettably, there is insufficient space here to deal adequately with all the views expressed in the dozen Conference papers, but the laudable decision to make them available in book form* gives an opportunity to a much wider audience of weighing the pro's and con's of the arguments and influences that will assuredly transform the social and farming fabric of Britain.

*Price 12s. from the Dept. of Agriculture, University of Oxford.

Finance in Agriculture

H. Fordham

AGRICULTURE differs from other industries in the private sector in being more directly and continuously affected by government policies. This critical distinction, as set out in the 1965 National Plan, is endorsed by the Agriculture Act 1967 which initiates further public interest in the industry. Two important factors emphasize the importance of agricultural development and improvement in productivity: firstly, the anticipated upsurge in population growth over the next two decades and secondly, entry into the European Economic Community. Long-term policies and targetting are essential for a stable and viable agriculture, but until details of an essential phasing in period to the Common Market are made available, assuming that entry will ultimately be negotiated, home agriculture must remain content with somewhat hazy horizons. In any event the availability of adequate finance will continue to be of prime importance and since capital and credit provide ways and means for all agricultural activity, some general examination of these factors may be of interest at this time.

Agricultural capital

Landlord-type agricultural capital comprises land and buildings. In addition to geographical situation, soil and other physical considerations, its value in money terms is materially affected by outside financial forces. Continuing encroachment on farmland naturally sustains high values, although it may not necessarily increase them, whereas inflationary trends are quickly reflected in rising land values. Agricultural capital has an attractive and unique element in the shape of estate duty abatement which, together with substantial tax concessions on agricultural buildings, gives added incentive to the ownership of agricultural property. In respect of tenanted land, values are much affected by security of tenure enjoyed by tenants and generally speaking, such property is of interest only to the professional investor, but if sale is offered, most tenanted properties are purchased by occupiers at a middle or slightly less price. It is, as yet, too early to assess the ultimate effects of the capital gains tax and the Land Commission Act 1967, on land values. Agricultural housing and buildings essential for the proper cultivation of land constitute an important element in the valuation of individual holdings, but the availability of grants and tax concessions tends to lessen the apparent value of fixed equipment. It is clear, therefore, that the real value of agricultural property is assessed by complex factors and bearing in mind that agriculture is more directly and continuously

affected by government policies, the value of such property cannot be regarded as permanently invulnerable.

Capital requirements

Husbandry is increasingly big business, requiring not only the skills of the field, but also the expertise of management. In particular, financial advice is best obtained from experienced professional sources and in respect of such transactions, careful attention should be paid to the terms and conditions proposed, it being generally too late to seek relief from harsh terms once the business had been contracted. Fortunately, there exists a wide and diverse choice of credit sources. They are of no determinate pattern, having evolved over a long period to meet the needs of the times. Agriculture requires capital for short- medium- and long-term purposes. There is no exact definition for these but generally speaking it can be said that short-term implies a period of up to two years, medium implies a period up to about seven or eight years and long-term over eight years. The largest and most appropriate source of short- and medium-term capital is provided by the major banks whose branches throughout the country provide wide and efficient financial services. Some continental countries provide credit facilities through local co-operative or land banks, but few, if any, offer the same flexible and comprehensive service that is available through Britain's banks.

Short-term capital

Short-term capital normally known as short-term credit, is usually required on a seasonal basis for the purchase of seed, stock, fertilizer, feedingstuffs, etc., and is provided by the suppliers of these commodities and by the banks and in general is fairly widely available.

Medium-term capital

Medium-term capital is required for the purchase of machinery such as tractors, combines and driers, for the carrying out of minor improvements and maintenance work, and for the purchase of stock, stores and similar needs. Credit for the greater part of this expenditure is met by the simple but effective procedure of bank overdraft against deposit of title deeds. In a minority of cases a legal or agricultural charge may be required. Assessment of a farmer's credit worthiness, is a matter of personal judgement by his bank manager, taking one year with another, but this onerous task may be dealt with by head office computers in the not too distant future. An added facility to this type of credit originally sponsored by the National Farmers' Union provides overdraft guarantees for farmers who cannot satisfy normal credit conditions. The scheme, which now enjoys Government support, is effected through the Agricultural Credit Corporation Limited and has done excellent work in enabling some farmers to obtain credit which would not otherwise have been available to them, at least on reasonable terms. Similar facilities are available for Farmer's Co-operatives from the Agricultural Finance Federation. Other sources of medium-term credit comprise hire purchase companies, merchant banks, the Milk Marketing Board in respect of certain milk-storage facilities and various organizations which have a narrow but definite interest in the sale or use of their particular product.

Long-term capital

The long-term capital requirements of agriculture fall mainly under the heads of farm purchase and land improvement. In this field of credit there is also a wide and varied choice. Life assurance offices provide substantial amounts of capital, normally by way of first mortgage in conjunction with life assurance. Building societies make limited advances but their participation is now much less than hitherto. Substantial advances are also provided from various funds entrusted to solicitors, but investment by a collective group, perhaps best defined as 'farm relatives' which term includes Trustees of Marriage, Discretionary and other Settlements, previous owners and family relatives, exceeds that of any other source. In addition to these facilities there are two institutions set up by Acts of Parliament. These are the Agricultural Mortgage Corporation Limited and the Lands Improvement Company. The Corporation, set up in 1928, makes loans by way of first mortgage for farm purchase and general agricultural purposes and for capital improvements. The Corporation have recently extended their mode of operation by accepting repayment of mortgages under endowment assurance policies or by equal instalments of capital. Section 28 of the Agriculture Act 1967 introduces a new type of government guaranteed loan in connection with the voluntary amalgamation schemes provided for in S. 26 of the Act. These provisions are intended to encourage and stimulate voluntary amalgamations of uncommercial units with other land; S. 28 will be most useful in those cases where requirements for normal credit facilities are not met. The amount of loan which may be advanced under an approved scheme may be as high as 90 per cent of the overall valuation, or even 100 per cent in the case of certain small amalgamations. These loans will be administered by the Agricultural Mortgage Corporation Limited and an explanatory leaflet dealing with this scheme is available from the Ministry's Divisional Offices and from the Corporation.

The Lands Improvement Company, incorporated in 1853, is the sole survivor of several financial institutions set up under Acts of Parliament in the mid-nineteenth century to encourage the development of agricultural land and, in particular, land drainage. The Company's main business is to provide long-term loans for all permanent improvements on estates and farms, subject to the approval of the Ministry of Agriculture, Fisheries and Food, as required by the several relevant statutes which are known collectively as the Improvement Acts. The improvement loan is a unique type of credit since the deposit of title deeds is not required. The loan is secured by way of a rent charge or annuity charged under absolute orders of the Ministry on the lands benefiting from the work. The improvement loan cannot be called in, not even in default.

Credit and taxation

The incidence of taxation is a major consideration in all spheres of agricultural finance and an individual's rate of tax liability may affect his ability to develop and improve his holding. Substantial tax relief and concessions are available in connection with permanent eligible improvements and, for the high rate taxpayer, expenditure on such works can be substantially set-off against tax liability. Loan interest can also be charged against taxable income and the effective rate of interest is of course much reduced for the standard or higher rate taxpayer. Long-term loan rates of

interest are, in the main, determined by the amount of funds available in the Money Market where agricultural needs are in competition with other industrial and commercial demands; the effect of change in bank rate on long-term interest rates is now psychological rather than practical.

Agricultural prospect

Entry into the European Economic Community must precipitate major change in the structural and financial pattern of home agriculture, and may provoke the emergence of large agricultural undertakings whose viability will depend on a capability for maximum and efficient use of financial and technical aids. Ownership may seek greater protection within the framework of limited liability using risk capital, supplemented by loan or debenture borrowing for development expansion and improvement. Present members of the Common Market have largely retained their pre-market agricultural credit facilities whilst state aid is provided in divers ways including guaranteed loans, subsidized interest rates and grants. However, it is clear that the basic long-term aim of the Community is that no member shall enjoy more advantageous financial facilities than its partners, but in the light of present limited information, comment on this aspect must be regarded as mere conjecture. More certain is the fact that substantial capital and credit will be required by home agriculture for what may eventually be regarded as the agricultural revolution of the 'seventies and it will be essential for the industry to offer an attractive financial prospectus to the would be investor.

This article has been contributed by **H. Fordham, F.C.I.S.**, who is manager of the **Lands Improvement Company**.

Agriculture (Miscellaneous Provisions) Act 1968

Further measures to safeguard the welfare of farm animals, to increase the compensation payable to tenant farmers whose land is needed for development, to amend the law relating to the termination of agricultural tenancies in Scotland acquired by succession, and to revise drainage rates and drainage charges on agricultural land and buildings in England and Wales, are set out in the Agriculture (Miscellaneous Provisions) Act which received the Royal Assent on July 3rd.

Part I of the Act supplements for farm animals the general welfare safeguards given by the Protection of Animals Acts and gives effect to the Government's decisions on the report of the Brambell Committee which examined the welfare of livestock kept under intensive conditions of husbandry.

Part II of the Act gives effect to the Government's proposals for special payments, equivalent to four years' rent, to be made to a tenant farmer who is displaced for development, forestry or any other non-agricultural purpose.

The Act also includes provision for schemes to be made for payment of grant on field beans and other break crops; legislative authority for the stabilization arrangements for the bacon curing industry; modification of the Restrictive Trade Practices Act 1956 in relation to agricultural marketing boards and co-operative associations of farmers, foresters and fishermen.

The County Agricultural Adviser for Pembrokeshire discusses the activities of the farm business and commodity groups in Wales

Farm Management Groups in Wales

A. J. B. Ratcliffe

AGRICULTURAL and rural communities have for many years been accustomed to group activities in one form or another, whether it was as in the past—communal shearing or threshing—or as now, the local village meeting, the N.F.U. meeting or even a N.A.A.S. meeting on farm business. From the outset the National Agricultural Advisory Service quickly realized the importance of this method of communication. This is illustrated by the spate of farm walks, demonstrations, conferences, academies and seminars that have been held for the last twenty years. This variation on the group approach theme has enabled the N.A.A.S. to rapidly communicate technical and economic information to the farming community and, when appropriate, to other groups such as bankers, accountants and merchants.

Most group-activities succeed in making their audiences 'aware', and possibly 'interested in the subject', but the appraisal of the topic, its evaluation and its final adoption in the field is usually left to the farmer, or possibly to the farmer and his adviser.

Many people prefer the 'individual approach' and most people will agree that the analysis of a farm business demands both understanding and mutual confidence on the part of the farmer and adviser. In this intimate relationship the problems and opportunities of the farm, and the farmers' personal preferences, can be examined constructively, leading to a farm business plan suitable to the farmer, to his land, his labour, his capital and his family. This is the situation in which a farmer and his adviser usually find themselves.

Can this same work be done using group methods? If it can, there may be a bonus in time saved, a reduction in individual follow-up visits and a better appreciation of business methods resulting from a repetition of actual management case-studies in the group meetings.

Management groups

When the programme for Farm Management Development was being planned in Glamorgan for the 1962-63 year, the N.A.A.S., aided very materially by an enthusiastic and influential farmer, established its first 'Business Management Dinner Group' in the Gower district.

This and subsequent groups were convened on the understanding that each individual member would respect the confidence of the other, that each would be willing to have his farm accounts analysed by his District Agricultural Adviser and that each case would be discussed in the group, together with proposals for the future.

As a result, participating farmers found that being a member of a group is an interesting and rewarding experience, giving confidence because of group acceptance of alternative or expanding systems. The N.A.A.S. staff in Glamorgan encouraged by the success of the Gower Management Group soon formed a further six groups in the county.

This rapid progress in organizing business discussion groups was greatly assisted by a leading Glamorgan farmer. He attended the initial meetings of all the different groups. Whenever there was reluctance among the farmers present to accept the idea of group-analysis of their trading accounts, he placed his own farm business figures on the table for discussion, whereupon the atmosphere of scepticism, over-caution and distrust was dispelled. This man's precept and example helped materially in gaining acceptance for what seemed to many at first sight to be a startling idea.

During the following winter the author and a farmer from the Wenvoe Group were invited to Welshpool, Montgomeryshire to assist in the formation of a similar group. The business figures of the Wenvoe farmer were used to explain how the groups operated. As a result the Welshpool farmers established their own Management Dinner Group, which followed a similar pattern to those in Glamorgan, and in due course a second group was formed. These closely-knit groups are interested not only in business analysis and methods but also in co-operation. Already the first group in Montgomery employs its own farm secretary.

Experience has shown that this method of approach can be of real assistance in development of farm management. It has enabled mutually acceptable farmers, to profit from the careful analysis and frank discussion of their individual business problems, conducted in a friendly and informal way over a meal with a few neighbours whom they like and respect.

In the winter months, the discussion groups are concerned with business analyses. In summer, farm walks are arranged on members' farms, to give participants first-hand knowledge of each other's practical application of farm management. These farm walks also help to engender new ideas from the group on how a member might improve his own operations.

For example, investigation may reveal a low stocking intensity of cattle on pasture. This might lead to a discussion on how the rate of stocking could be improved, perhaps by purchase of additional animals or by cropping of surplus grass areas. In either case, budgets would be prepared to show the additional capital needed and the probable returns per acre and per unit of capital invested.

One discussion group, after examining the accounts of several members, became concerned over the high charges for power and machinery on their farms. At a subsequent meeting, a detailed examination was made of members' machinery costs, in an effort to find ways to reduce them.

Another group invited a local bank manager to discuss the use of credit and capital in the context of farm management. The discussion proved no less informative to the bank manager than to the farmers!

By 1965 the group members were sufficiently well grounded in management thinking to more than hold their own at a combined dinner of all

groups when the guest speaker was a farmer and merchant banker. The quality and depth of discussion amply repaid the efforts of the previous winter.

Commodity groups

In Pembrokeshire, the approach differs; groups of farmers are getting together to study the opportunities inherent in the various county farm commodities. Success is being achieved in beef production systems; early potato production has lead to a liaison with farmers in potato seed growing areas like Brecon and Radnor; and there is a pilot scheme in operation for the production of cauliflower on contract.

In this latter case, a group of farmers have agreed to grow specified varieties of cauliflower to be harvested in late winter where the milder climate of the west has advantage over the Eastern Counties. The cauliflower crop is not new to the county, but the marketing method is different, in line with the needs of the new distributive channels to supermarkets and other outlets. Thus, management and commodity groups are assisting N.A.A.S. in Wales to stimulate interest amongst farmers in the business approach to wider opportunities.

Summary

The advantages to date of farm business and commodity groups can be summarized as:

1. They offer wider opportunities for discussion of technical developments that might be applied on members' farms.
2. They encourage mutual aid and co-operation.
3. They provide opportunities for members to acquire a better knowledge of farm business methods.
4. They make possible an enlightening comparison of each member's farm enterprise with those of others operated under similar soil, climatic, and marketing conditions.
5. They help a farmer to obtain a more precise knowledge of his own business: how it should be developed to make more money; or how to reduce the managerial load.

This article has been contributed by **A. J. B. Ratcliffe, N.D.A.**, who is County Agricultural Adviser for the N.A.A.S. in Pembrokeshire. Previous to taking up this appointment he was Deputy County Agricultural Adviser in Glamorganshire.

Care in Burning-off Straw and Stubble

The greatest care must be taken in burning-off straw and stubble to ensure that the operation is kept under proper control.

Fire is a serious hazard, particularly during dry conditions, and if burning-off is not done carefully, other people may be placed at risk and damage caused to property and wild life.

Farming Cameo : Series 4



14. West Dorset

G. P. F. Lane

THE countryside of West Dorset together with the attractions of Lyme Bay provide a pleasant environment in which to live. The two main towns are Bridport, with the small harbour of West Bay, and Beaminster. The area is bisected by one major road leading to Devon and Cornwall, otherwise road communications are only modest. The branch railway line from Maiden Newton to Bridport has, however, survived the cuts. Certainly the scenery, the Chesil Beach and Golden Cap attract tourists who, with their spending money, make a welcome addition to farming incomes, yet agriculturally this is no backwater.

This is a good grass-growing area with a rainfall approaching 40 in. per annum and a wide variety of soil types. It is almost impossible to find a successful farm not incorporating a modern, intensively managed dairy herd. The I.C.I. farm at Henley Manor, Crewkerne, Somerset, has a big influence on grassland intensification in the district mainly through increased fertilizer use. Richard Barber, a young farmer of Seaborough Manor near Crewkerne practises a highly intensive system with a stocking rate of two hundred and eighty seven cows on 250 acres. A well-drained Greensand soil,

400 units of nitrogen and up-to-date milking and housing arrangements (and Henley Manor over the hedge) provide ideal conditions for intensive dairying on this scale. Nevertheless, a high level of stockmanship is required to maintain good average yields and with good grassland management concentrate costs are kept to a minimum.

Direct or 'sod' seeding of kale, after spraying old pastures with paraquat is a technique widely used in this area. There are now three rotary seeders operated by contractors in West Dorset. Kale grown in this way is usually satisfactory and grazing on heavy or flinty soils is much improved. Grass seed is also sown with these machines. The results are usually good with rapid pasture establishment.

Steep slopes are a feature of West Dorset particularly in areas of Lias sands and oolitic limestone. Four-wheel drive tractors for ploughing and reseeding are invaluable on these slopes for pasture improvement. Ploughing and Scrub Clearance Grants have encouraged this type of work. The results are spectacular in terms of increased stock-carrying capacity.

Small family dairy farms characterize the heavy land areas of the Vale of Marshwood and parishes such as Halstock near Yeovil. Intensification of grassland management in these areas is hampered by poorly-drained soils. Much work remains to be done but pioneers are showing what a well-drained farm can produce. Herds of 40 dairy cows appear capable of supplying a good family income and use is made of contractors and relief milkers to overcome labour peaks and make possible such necessities as holidays.

Grass conservation is a perennial problem. Silage is a key part of any intensive grass system but there are many disadvantages to silage, particularly the large losses which can occur even in the most carefully made clamps. The 'Dorset Wedge' technique, together with careful management of polythene sheets, has enabled losses to be reduced but some farmers are considering grass drying as an alternative. A firm of farmer/contractors is in the process of installing a drier to cope with the entire grass production of its farm. This is an interesting experiment and it is possible to foresee a co-operatively-owned drier supplying much of the winter feed for a large number of stock. One such co-operative has already been postulated but it remains to be seen how the idea develops.

Climate and topography do not permit cereal growing on a large scale but some farms in the east of the district on chalk land practise 'barley and sheep' systems. Many other farmers grow a small cereal acreage. Modern facilities for drying and storage are provided by a co-operatively-owned grain plant on the farm of Mr. P. F. Tiarks situated at Melplash near Bridport. Supervised by the farm manager, Mr. P. E. Stanley, this installation handles about 2,000 tons of grain annually. The facilities are shared by 16 farmers. Cereal yields have been far from satisfactory in recent years and a high level of incidence of leaf disease is an important problem in the area. Yields of oats are often quite good, however, and the acreage grown of this crop may well increase.

Modern agriculture and areas of 'outstanding natural beauty' sometimes conflict. In West Dorset, however, the two are married and the union appears to be most successful.

FROM THE A.L.S.

The author discusses the type of cubicle that is used for the housing of hill cows, with creep for calves, on a Westmorland Farm

Cubicle Housing for Hill Cows

T. D. Hill, *Agricultural Land Service, West Riding of Yorks*

GHYLL HOUSE, Dufton, Appleby, Westmorland is a 420-acre owner-occupied holding with additional rented land and fell grazing rights. It varies from useful sound land at 600 ft on the eastern edge of the Eden Valley, up to very exposed heather allotments adjoining Dufton Fell at 1,300 ft. The policy best suited to the land is dairy and arable on the lower land with beef cattle and sheep on the poorer and higher land.

Some time ago the A.L.S. was approached by the owners, Messrs. G. Richardson and Sons, about replacing two out-dated and dilapidated field houses situated on the higher slopes of the farm, roughly one mile from the steading, used to house beef cows and single-suckled calves.

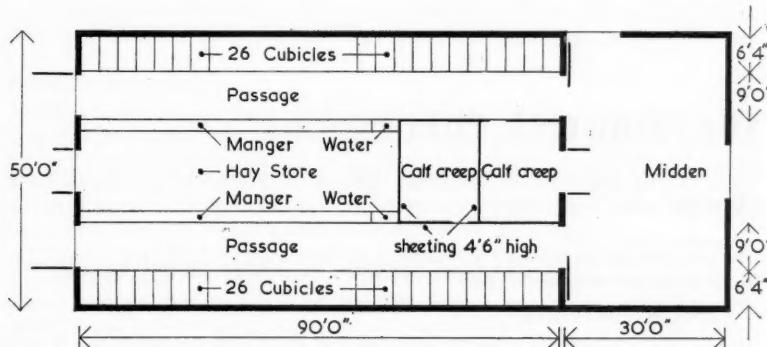
Under the then existing layout, a journey had to be made at least twice daily throughout the long winter period to fodder and attend the breeding cows at the field houses, sometimes in the most severe weather conditions. This amounted to three or four hours work each day. As well as the time taken to attend to these cattle, the poor housing conditions meant an irregular calving cow, a small calf, a lot of good fodder wasted as bedding and the pastures around the field-houses badly poached. After consultations with the A.L.S. and visits to other farms, the owners wisely decided that considerable time and money could be saved, in their case, by providing suitable winter housing at the steading.

As the existing buildings were traditionally built and limited in width and scope, it was decided to erect a clear-span, general-purpose shed in a position which could, in future, be adaptable for conversion or extension. When planning the layout of the building, it was proposed to loose house the cows in two sections on straw, with the centre of the building taken up with a hay store and calf pens. After further investigation, however, it was finally decided to install cubicles instead of the strawed areas.

The building erected accommodates fifty-two cows, plus calves, together with hay storage for the winter period. The cows are nearly all Blue-Grey with a few Shorthorns and are mated with a Hereford Bull, which also is housed in the cubicles. The cows are brought into the cubicles in November or December depending on the weather, and cannot be turned out in this area until mid-May. Of the cows housed only two of the older ones refused to use the cubicles. When the cows are springing to calf they are taken out of the cubicles and either tied up or put into a loose box for calving and,

when well-mothered after one or two days, are returned to the cubicle building. The calves find the creep after a day being attracted by a deep straw bed, concentrates and a pilot light at night. The central calf creeps are sheltered by sheeting 4 ft 6 in. high and only have one access, which limits the draughts. The calf creeps are also designed so that they can be enlarged when the calves grow bigger and the fodder decreases.

The cubicles are only some 6 ft 4 in. long and at average 3 ft 5 in. centres, which appears to be quite satisfactory for these relatively small hill cows. The bed of the cubicles, which is flat, is of dry earth topped with straw. The straw bed is only replenished once each season. There is a 9 ft concrete passageway behind the cows and the deep feeding troughs (2 ft length per cow) have a vertical steel frame up the front at 12 in. centres, which eliminates barging by the stronger cows at feeding time. The slurry problem associated with cubicle layouts is kept to a minimum by the feeding of only hay and straw, and the building is cleaned out, at the most only twice weekly to the middenstead on the east end. This more solid slurry can then be handled at approximately six weekly intervals with the conventional loader and spreader.



Cubicle building for hill cows and calves at Ghyll House, Dufton, Appleby

The shell of the clear-span building is a concrete framed structure, 11 ft average height to the eaves, with 8 ft high 9 in. block perimeter walls, with cladding up to the eaves. The building is enclosed except on the sheltered west gable where it is open above the cladded gates. Ventilation is provided in three places, above the cladded gates, through a 3 in. vent between the walls and the side cladding, and by vents in the top row of roof sheets each side of the ridge. This combination of inlet and outlet ventilation provides good conditions such as freedom from draughts and condensation throughout the winter season for these hardy animals.

With the exception of the concrete framed structure this building was satisfactorily erected with farm labour. The final cost per cow of £53 after allowing for grant, included the building concreted throughout, calf accommodation, fodder storage, a concrete walled middenstead and concrete aprons.

The farm now has a very comprehensive building to house 52 cows plus calves, which could also be easily adapted for other purposes. The time taken

to feed and attend these animals has been reduced to a quarter of the original, the cows are much fitter and consequently breeding stronger calves at more regular intervals, bedding costs have virtually been reduced to nothing and the winter poaching of pastures has been eliminated. Apart from the improved building the success of this project, which has proved itself over the past three winters, has in no small measure been due to very good stock management.

There are, of course, some critics of proposals to erect permanent farm buildings to house beef cows in this era of fast changing systems and new techniques, but where there is a need for covered accommodation in a high rainfall area, a properly sited clear-span, framed building at least 45 ft wide and 10 ft to the eaves, will never become redundant. Other farmers similarly situated may, therefore, feel encouraged to consider whether in their own particular circumstances the financial and other benefits likely to accrue would justify them in contemplating an improvement along these lines on their own holding.

The Ministry's Publications

Since the list published in the July, 1968, issue of *Agriculture* (p. 319) the following publications have been issued.

MAJOR PUBLICATION

The Farm as a Business. Aids to Management 7. Arable Crops and Grass (Revised)
2s. 6d. (by post 2s. 11d.)

MECHANIZATION LEAFLETS

No. 7. Unit Drills for Root and Vegetable Seeds (Revised) 1s. (by post 1s. 3d.)
No. 20. Farm Grinding (New) 1s. (by post 1s. 3d.)

FREE ISSUES

ADVISORY LEAFLETS

No. 19. Pasteurellosis (Fowl Cholera) (Revised)
No. 57. Wingless Weevils (Revised)
No. 129. The Loganberry (Revised)
No. 182. Spurrey (Revised)
No. 485. Pollination of Plums (Revised)
No. 529. Corn Marigold (Goldings, Yellow Oxeye, Yellow Battle) (Revised)
No. 537. Flies and other Insects in Poultry Houses (Revised)
No. 558. Pasture Improvement (Including the use of Chemical Weedkillers)
(New)

SHORT TERM LEAFLETS

No. 21. Hot Water Treatment of Narcissus Bulbs (Revised)
No. 77. Promising Cultivars of Hardy Fruits (New)

UNNUMBERED LEAFLET

The Agricultural Land Service can Advise you (Revised).

The priced publications are obtainable from Government Bookshops (addresses on p. 406) or through any bookseller. Single copies of free items are obtainable only from the Ministry (Publications), Tolcarne Drive, Pinner, Middlesex.

in brief

- Britain's new forests
 - The comfortable pig
 - Butyl silos for moist grain
-

Britain's new forests

TREES are both a crop and an amenity. Down through the centuries beyond recorded time they have served the needs of mankind for his primitive tools and weapons, his transport and shelter, and his source of heat. It is hardly surprising that among early peoples they should have become the object of veneration or that today townspeople and countryfolk alike are as one in their appreciation of the important part which trees play in the architecture of Britain's landscape.

It was less than fifty years ago that the Forestry Commission came into being and a purposeful policy of afforestation was introduced. Before the first stirrings of official consciousness on this subject in the 1880s, it was left to the initiative of private woodland owners to make good in some measure the progressive inroads on the original forest cover. To our native broad-leaved trees, the oak, ash, beech and elm, etc., were added the imported conifers (the Douglas fir, Sitka spruce, Corsican pine and Japanese larch) and other species from overseas.

So began a major change in the composition of Britain's forests, a diversity which the Forestry Commission has promoted on a scale that has not only substantially increased home supplies of softwood, but by judicious siting has invested the countryside with a beauty unsurpassed by anything which the older forests of continental Europe can show.

Which trees, and where to plant them, are essentially matters governed by topography, soil and climate, and thus the new, lavishly illustrated booklet, *Forestry in the British Scene*,* which the Forestry Commission has issued to show the correlation of the principal forest trees with environment is both a record of, and a tribute to, the foresters' craft.

To its existing 1½ million acres under tree crops, the Forestry Commission plans to plant a further 450,000 acres in the course of the next ten years, mainly in upland areas and particularly in Scotland and Wales. Integrated with agriculture and foreseeable future developments in social patterns and activity visualized in the Countryside Act, these new forests are seen as an investment that cannot fail to enrich the country financially and aesthetically.

*H.M. Stationery Office, price 10s. (by post 10s. 9d.)

The comfortable pig

We may have given up keeping pigs in pokes, but all too often they are not housed as comfortably as they might be. The effect of environment on growth and conversion rates is one of the most important single factors in pig keeping. But it is a factor that has several facets—air temperature, humidity, air movement rate, radiation of warmth or coldness from walls and ceiling, light, sound, presence or absence of bedding, type of floor, stocking density and the feeding and management system. And conditions that are acceptable for older pigs are not suitable for piglets.

Mr. Clement Pointer, the N.A.S. Livestock Environment Adviser, makes this point abundantly clear in a first-rate little publication called *Environment and Pig Production*, which the Chelmsford Office has issued. It is insufficiently realized how delicate the baby pig is, compared with the young of other livestock. They generate very little heat and are therefore more prone to cold, in which condition they lie around, fail to suck properly and so run the all too likely risk of being overlaid by the sow.

Nearly 25 per cent of all pigs born alive die before they are eight weeks old. 'It should be possible to reduce this figure to 15 per cent without undue expense and trouble', says Mr. Pointer. 'Such a saving would result in an extra annual profit to the pig industry of about £4 million'.

Later, as the pigs grow bigger, they are less tolerant of heat, and at high stocking densities it can become difficult for them to lose enough heat. House temperatures, taken *at pig height*, must therefore be watched and, purely as a guide, the following figures are useful: 40–100 lb l.w., 60–70°F; 100–200 lb, 55–65°F; over 200 lb, 50–60°F. But these, of course, must be modified in the light of particular management practice—i.e., rate of air change, whether or not bedding is provided, floor insulation, numbers in any given area and the level of feeding. Except at very high or low temperatures, humidity is less important; 60–80 per cent relative humidity should normally be acceptable.

Absolutely ideal conditions in the piggery will be the exception rather than the rule. Most farmers will fall back on a commonsense compromise, but to be aware of environmental cause and effect is a sure step towards their control. The comfortable pig is the profitable pig.

Butyl silos for moist grain

Wheat and barley of around 20 per cent moisture content can be stored safely in sealed butyl rubber containers for several months. This advice comes as a result of experience at the Gleadthorpe (Notts) Experimental Husbandry Farm and should be attractive to farmers who want to store only, say, 40–50 tons of moist grain for feeding on the farm, or those farmers who plan to feed a limited quantity of moist grain during the summer months.

As the Director of Gleadthorpe, Mr. P. N. Harvey, points out in his annual report, most of the trouble with sealed silos occurs when a large silo is nearly empty at the end of the season. If a smaller, separate container is kept for summer use, the main store can be cleared by the end of the winter before the weather starts to turn warm.

The butyl bags hang on frames which, as at Gleadthorpe, can be erected easily enough by farm staff, and since tears or punctures in the bags can be readily repaired, it is reasonable to expect a five-year service from them.

The capital cost is put at £4 15s. per ton stored, which is less than half that of a metal silo complete with foundations (no concrete base is needed for the butyl silo).

It was also found that, unlike plastic bags which Gleadthorpe tested a couple of years ago, the butyl bags were not damaged by rats or mice.

AGRIC

Books

The Pesticide Problem: an Economic Approach to Public Policy. J. C. HEADLEY and J. N. LEWIS. Oxford University Press, 1967. 28s.

J. C. Headley is associate professor of agricultural economics at the University of Missouri, and J. N. Lewis, professor of agricultural economics at the University of New England, Australia, collaborated with him on this book while visiting the University of Illinois. The authors believe that the pesticide problem is: 'largely and inescapably economic in nature'. Their first chapter includes six tables giving the weight of pesticides produced, weight used, crop acreages, and areas treated, in the U.S.A. in the 1950s and early 1960s. They conclude Chapter 1 with a discussion on the efficient allocation of resources, and they point out that, beyond a certain level, little extra insect kill or yield increment is obtained by using more chemical. However, the optimal quantity of pesticides from an individual grower's viewpoint may be greatly in excess of the 'socially optimal level', and very high dosages are sometimes used for small additional gains. Thus, there is a need for a pesticide policy which will combine the best farm output with least interference with public health, recreation, and aesthetic value.

In their second chapter the authors suggest how this may be achieved; but they admit that their decision framework assumes that cash values can be placed on 'external effects' like wildlife and alleged ecological imbalance: 'the valuation problem is inescapable in decision making', and 'the act of making a decision implies the placing of values on alternative outcomes'. Sometimes, such values can only be guessed at; given enough data, one can estimate a possible benefit from, for example, the eradication of a crop pest, and this figure can be used in two ways: eradication costs can be equated against it to assess profitability, or it can be taken as a measure of the sacrifice if eradication is ecologically, aesthetically, or politically undesirable. The authors hasten to add that we do not know the extent of the sacrifice needed to change the decision!

The conceptual and measurement problems in estimating the effects of pesticides used in agriculture are discussed in Chapter 3. Pesticide assessment is more complex than evaluating fertilizers or farm machinery because possible side-effects must also be sought and measured; shortage of data at present limits the conclusions which can be drawn.

Chapter 4 reviews the agricultural consequences of pesticide use, and there are eight tables showing the yield increases recorded in field trials in the U.S.A. with insecticides, herbicides and some fungicides, mostly over the past 20 years. There is a particularly interesting section (pp. 72-75) on Pesticides and the Organisation of Agriculture, in which chemicals are rightly regarded as an integral part of the momentum of agricultural progress. The yield data should not be taken too literally because the authors do not say whether the field trials were truly representative of the conditions under which the crops were grown commercially in the areas concerned. But they cite pesticides as partly responsible for changes in the regional distribution of several major crops, including the westward movement of the cotton industry, and the reader is left in no doubt that agricultural chemicals are essential in modern high-efficiency farming.

The authors conclude that residues do not at present pose a significant threat to human health, but they recommend continued research on residues in water supplies, adequate monitoring of food residues, and that a very close watch should continue to be kept on the health of workers who are occupationally exposed to higher pesticide concentrations than the general public. There is no doubt that in fish and wildlife pesticides have had adverse effects, but there are not enough reliable data to estimate quantitatively the overall effects of agricultural chemicals on wildlife. The authors conclude that, even if wildlife effects have finally to be treated as incommensurables, it is still desirable to assess the effects of mandatory wildlife protection on agriculture and human health.

The final chapter: Public Policy and Research Needs, is a succinct summary of the kinds of information needed before logical public policies can be devised. It is often easy to criticize official policies, but such criticism is of little use unless it indicates what investigations are needed and how to obtain the data which can lead to a more logical policy. There are complex and universal problems, we are told, for biologists, chemists, economists, and politicians, singly and in multi-disciplinary

projects. However, in the author's view, nothing will expose the limitations of universal remedies better than formal economic analysis of the costs and benefits to society of alternative actions affecting pest control.

A.H.S.

Woodland Management. (2nd Edition).

W. E. HILEY. Faber and Faber, 1967.
Six guineas.

In the long-term business of forestry every manager must plan to ensure that money invested today, or in the past, will earn an adequate profit in the future. About thirty-five years ago Leonard Elmhirst, the guiding hand of Dartington Hall, centre of rural studies in Devon, realized that little was known about the application of forest economics to English estate woodlands. He, therefore, invited Wilfred Hiley, then a teacher of forest management at Oxford University, to take over the practical running of Dartington Hall woodlands.

Over the next twenty years Hiley, who was a tremendous enthusiast for the share of the private landowner in forestry development, amassed hard facts, costs, and know-how which he brought together in the first edition of this excellent text-book. Following on his death, two leading forestry advisers, C. W. Scott and R. W. V. Palmer, have brought his work up to date by drawing on the latest researches of the Forestry Commission, and adding pictures of the most modern equipment for weed control and timber harvesting. A particularly valuable addition is the Yield Table system devised by R. T. Bradley, which shows what trees produce most timber, and how fast they should be felled and marketed.

Every aspect of forestry that contributes to cost and profit is expertly analysed here, including wage rates, timber prices, management schemes for woodland estates, interest calculations, Forestry Commission grants, and even income tax. When Hiley began his studies there were only half-a-dozen estates in Britain that were working their woods on soundly-based long-term plans. Today there are over 2,000 such schemes registered with the Forestry Commission. The reason is simple: Hiley proved by his writings, and practical example, that timber growing would pay. Everyone concerned with woodland management, whether as owner, forester, land agent, or consultant, will find his rejuvenated standard text-book a concise and trustworthy guide to forward planning.

H.L.E.

Colorimetric Methods of Analysis. (3rd Edition). (Vol. IVA). D. SNELL and C. T. SNELL. D. Van Nostrand, 1967. £7

In their preface the authors state that this volume was started as a supplement to Vol. IV, but the wealth of the material had made it necessary to issue this in two parts, Vol. IVA is the supplement to the first seven chapters. It provides an account of the colorimetric and photometric methods of analysis for many organic compounds of non-cyclic and cyclic nitrogen. The six chapters cover nitrites, nitrates and nitro groups; aliphatic amines and amides; amino acids; proteins; aromatic, primary, secondary and tertiary amines; and azo compounds.

Treatment of the contents of each chapter follows a pattern established by the authors in previous volumes. The principles and analytical procedure are given for each compound dealt with. These are followed by sections giving details of the application of the method to various substrates. Agricultural materials, including feedingstuffs, plant materials, soils and milk received full attention. The general problem of the separation and 'clean up' of extracts is dealt with whenever it arises. The techniques used to accomplish this include paper, thin layer, and column chromatography, electrophoresis and electrodialysis. Practical details are given but there is no discussion of the fundamental aspects of these techniques.

The two most important chapters deal with amino acids and proteins. The rapid expansion in the use of commercial and laboratory-built apparatus for automatic separation and colorimetric determination of compounds, in particular amino acids, is not fully reflected in the book. A section dealing with this relevant topic would increase the practical usefulness of the volume. The determination of protein using dyes is fully covered. However, the section on protein nitrogen does not include any references to the indophenol blue reaction for the determination of ammonia, although procedures using Nessler's reagent and ninhydrin are given.

This book contains a great deal of analytical information presented in a clear, systematic manner and the text is fully supplemented with diagrams and tables. References to original work are numerous and appear at the bottom of the page, a very convenient method of presentation.

These few criticisms do not detract from its value. It is a practical book for the chemist concerned with the analysis of biological materials, and will form a useful addition to his bookshelf.

J.L.O.J.

Machines for Power Farming. (2nd Edition).

ARCHIE A. STONE and HAROLD E. GULVIN. John Wiley and Sons, 1967. 85s.

This edition of *Machines for Power Farming* appears to be written to meet the needs of American students at Farm Institutes, rather than University level. British students, even those with modest requirements, while finding much of interest in it, will also find it lacking in many respects, and even confusing in parts, due to its American terminology and spelling. For example, each chapter ends with a section of questions and discussion topics and, while this provides a useful check on the reader's absorptive capacity, the questions are often very elementary or even confusing to the student weaned on British terminology.

Almost half the book is taken up by sections on tractors, primary tillage and what is called seedbed refining. A subsection on the application and control of engine power is useful, but too much space is devoted to descriptions of engines and their ancillaries. Admittedly, the title of the book suggests field machinery, but some of the much-trodden ground could have been omitted in favour of chapters on barn machinery and crop-drying equipment. It is also disappointing, coming from a country with more experience than any other of tower silo loading and unloading equipment, that information in this field is also lacking. However, there is much practical advice given on the correct operation of metered chop forage harvesters, but the simple flail harvester, which is at present our most important silage-making machine, is dismissed in a few words. This may be suitable for American students but leaves an important gap over here. Similarly, the centrifugal fertilizer distributor which probably outsells all other types is not mentioned.

The final section of the book, on tractor and machinery management, contains some interesting tables relating to machine working rates and running costs (the latter in dollars, of course) which could well apply on British farms. This section could profitably have been enlarged at the expense of certain other sections.

One has sympathy with the authors of text-books of this nature; the subject is very large with changes constantly taking place. In addition, it is difficult to pitch the text at the right level and in this case the aim is too low. It is a volume which deserves a place in the college or institute library but its price will discourage the individual student from buying, bearing in mind its limitations.

D.E.W.

The Veterinary Annual 1966-67. Edited by

W. A. POOL. John Wright and Sons, 1967. 63s.

Now in its eighth year this annual volume is gradually assuming an indispensable role, particularly for those whose access to library facilities is limited. As a source of reference and a fund of up-to-date veterinary information covering the widest possible field it is outstanding. Very little of consequence in the veterinary sphere appears to escape attention.

In this present issue, compressed within 354 pages, are seven articles on current developments, 13 sections on review of current literature, a list of new drugs and appliances, also an excellent index. In addition, the text is well illustrated.

The initial section on current developments may cause doubts as to whether its retention as a separate section is any longer justifiable. The editor is aware of this, as his preface makes clear, but this reviewer remains unconvinced by the arguments. If it were omitted in future editions the review section could be expanded. Indeed, some of the current articles—as the editor admits—e.g., Leptospirosis in Wild and Domestic Animals, Recent Developments in the Poultry Industry and Canine and Feline Geriatrics are review articles out of context. Others, like that on the Royal Show or the R.S.P.C.A. Hostel for Animals at London Airport would appear somewhat miscast in this publication.

The review section maintains its usual high standard. There is something here for everyone and it is impossible to mention other than a few topics. Under bacteria and fungi there is an article on foot-rot in sheep by one of the acknowledged experts on its epizootiology and control; on the latter there is much down to earth practical advice. In this same section, an article entitled Mycotoxicoses deals with diseases caused by fungi which parasitize fodder plants. Some such as ergotism are well known but barley scab disease and yellow rice are less familiar names.

Under virus diseases there are two highly topical articles on foot-and-mouth disease, one on 'carrier' animals and the other on vaccination.

In the same section there is an article which describes how Newcastle disease was controlled in this country by the voluntary use of dead vaccines—an achievement incidentally deserving of greater credit than has so far been given. Under Reproduction there is an article on the breeding operations of the Milk Marketing Board, which includes a section setting

out the developments in artificial insemination in cattle. Other articles of special interest to agriculturists are those detailing recent advances in animal husbandry and nutrition.

There is an error on page 331, where it is stated that the veterinary staff of Animal Health Division at Headquarters and in the field amounts to about 150. A figure of 450 would be more appropriate.

A.H.H.

Rural Land Administration in New Zealand.
Edited by J. BRUCE BROWN. (Studies in Public Administration No. 12). Oxford University Press, 1967. 20s.

This book is the twelfth in the series of *Studies in Public Administration* published by the New Zealand Institute of Public Administration. The first study in this series entitled *Economic Stability in New Zealand* was published in 1953. As land is the backbone of New Zealand's economy, and quality of land administration has an important impact on the use and misuse of this key resource, is it irrelevant to ask why this book did not appear earlier in the series? Fortunately, the New Zealand Institute of Public Administration selected land administration as the theme for its 1965 Convention.

The volume consists of the six papers presented at that Convention, edited by J. Bruce Brown who writes the introduction. The 1965 Convention wanted to take a critical look at land use in New Zealand, at economic and social factors associated with land administration and the planning of land use. Each paper is written by men, in senior official positions, with detailed knowledge of their particular fields. Sometimes their writing becomes bogged down in details. Generally, though, they have an interesting and encouraging tale to tell.

The first paper by R. J. MacLachlan, 'Land Administration in New Zealand' is an evolutionary account of the influence of land policy in New Zealand's social, economic and physical development. It covers the time when land was first acquired from the Maoris up to the settlement of ex-servicemen after the Second World War, national parks and the current problem of uneconomic small farms. The second paper by E. K. Phillips, 'Land Tenure, Registration and Ownership' is a good summary of the growth of New Zealand's land tenure system. Its author who is Registrar General of Lands, Justice Department, makes some interesting suggestions for improving the present system of land registration in New

Zealand which are relevant to other countries including Britain.

The next two papers entitled 'Rural Land Use' and 'Economic Factors of Rural Land Administration' by L. W. McCaskill and R. H. Bevin respectively, take a close look at man's recent impact on New Zealand's land. McCaskill asserts that 'New Zealand has rather a shocking record as far as its treatment of land is concerned' and pleads for more careful plans for its conservation. Bevin in his paper covers a wide range of topics including Producer Boards, the training of land administrators and the relative scarcity of farm labour (capital is not lacking).

The fifth paper by J. D. Stewart, Professor of Farm Management at Lincoln College, deals with 'Financial Factors in Rural Land Administration'. Stewart shows that in New Zealand, as in Britain, the demand for land is often influenced by non-economic considerations as well as farming profits. Farm management data are given and such matters as the high ratio of capital to labour, the incidence of estate duties and the nature of farm liabilities are reviewed. Better farm accounting for 'more informed managerial and financial control' is demanded by Stewart.

The sixth and last paper, 'Planning in Land Use' by D. M. Greig, former Director-General of Lands, traces major events in settling and controlling land. Greig stresses the need for close co-operation between all Government Departments concerned with land use and ends his paper by advocating the establishment of a Chair of Rural Land Use and Planning.

This book gives an honest account of rural land administration in New Zealand and is valuable on that count alone. It also has relevance to some of Britain's land problems.

J.A.M.

Farming in the South East. BRYAN PLATT.
David Rendel, 1968. 35s.

This is not a technical guide to farming nor is it a detailed description of the farming of the South Eastern Region. To the intelligent layman, who is interested in our largest industry, it brings a comprehensive picture of present-day farming. The reader is taken through the seasons of the year and given a picture of the activities associated with them. He learns something of our breeds of livestock. He is given a very useful review of the farmer's commercial relations with the consuming public through marketing organizations and the Price Review.

There is an interesting final chapter on rural life and education.

This picture leaves no doubt that the farmer of today has to be a skilled technician and business man. New techniques are constantly being built into this age-old industry. The speed with which this is depicted as happening reveals our farming as vigorous and progressive. To use his own words 'there were fine farmers in those days . . . but there are also wonderful farmers now—men who have been trained to use and understand modern techniques, who treat their farms as commercial and highly competitive businesses'.

The author's knowledge of his subject is obviously wide. We learn from him that hop growing came to us from the Continent, hence the greater part of our national hop acreage is in Kent; that the central meat markets at Smithfield handle five-thousand tons daily and that ploughless cultivations and tractor obsolescence are future possibilities; that most commercial flocks of sheep are crosses and that farmers include antibiotics in their home-mixed pig feeds.

The references to farming in the South East are more easily recognizable than the delineation of areas of farming systems on the regional map. The author recognizes that wide differences in farming systems occur within relatively small areas. We should acknowledge that this book is mainly about farming and farmers, and that farming in the South East is used by the author as the medium to convey his message.

S.L.H.

Environmental Control in Poultry Production. Edited by T. C. CARTER. Oliver and Boyd, 1968. Six guineas.

The book is well printed and has an attractive cover. Thus speak I as an ordinary mortal, a field adviser (man and boy) for thirty years! Nevertheless, as a husbandryman I have found it in parts both exciting and complacent; at times boring but perhaps with a glimpse of new truths. There was much that I could respond to and much that I could not understand. Many points, alas, my experience flatly contradicts.

It is good, however, to feel at home at times—one author's view that 'the most pressing need is for a general theory relating the effects of growing light treatments to subsequent egg yield' is generally agreed. The view that 'frightened fowls have laying upsets' is not conclusive.

Others have made this discovery and called it bad management, not stress—surely this is not stress—abuse perhaps? Another author considers that the laying hen is a more adaptable animal than many environmental physiologists believe. What an epitaph for this wonderful Asiatic bird which gives seven times its own body weight in eggs in most world climes.

Whether this book is value for money is not a matter just of opinion but of fundamental approach.

C.T.R.

G. E. Fussell: a Bibliography of his Writings on Agricultural History. University of Reading, 1967. 7s. 6d.

'Mr. Fussell will always be remembered as the man who made agricultural history available to the general and academic public at a time when few were prepared to acknowledge its importance or fascination.' (Preface).

He is an amateur agricultural historian in the true sense of the word and during his forty years service in the Ministry he showed himself as an 'amateur de livres'—from which latter he was never far distant. His *Chronological list of early agricultural works in the library of the Ministry . . . 1930* (M.A.F., not M.A.F.F. as the bibliography records), one of his earliest publications, and his *Index to Arthur Young's Annals of Agriculture*, ranks high as a service to other authors; now Andrew Jewell has rendered a similar service to him.

Nineteen books and some five hundred articles in journals are listed in this work—and these apart from newspaper contributions; a fair output for any author, and this at an interim stage. The main arrangement of the list is (a) books: alphabetically by title, (b) articles: alphabetically by source (journal) sub-arranged chronologically. An index of authors and subjects written about, complements the main arrangement.

Apart from full bibliographical citation—including the extent of bibliographical references in books and articles listed—where it adds to the value of the citation, annotations are included. The only exceptions to this are the contributions to newspapers which are inadequately documented and would be difficult to locate.

Nigel Harvey has written an illuminating and instructive preface to the *bibliography*—which in its entirety is a publication from a triumvirate of high agro-historical rank in which the Museum of English Rural Life and Reading University must justly take considerable pride.

F.C.H.

Soils of the South West Lancashire Coastal Plain. (Memoirs of the Soil Survey of Great Britain), 1967. B. R. HALL and C. J. FOLLAND.

This is the second memoir dealing with Lancashire soils to appear, and covers the coastal areas lying to the west and southwest of the Preston District described in the earlier one. Since most of the soils described, with the exception of those derived from Dune sand and some alluvial deposits, are also found in the Preston area, the memoir is a valuable extension to that on the Preston district. It does not attempt to duplicate the excellent account in the earlier memoir of the influence of soil forming processes in shaping the soil pattern of the area and wisely so, since the coastal plain is much more limited in its variety of geology, climate and relief. Instead, it concentrates on more detailed descriptions of the soils found in the area and especially of the 'moss' soils on which Basil Hall is by way of being an expert.

This part of Lancashire is very important agriculturally since a big proportion of it is under intensive agriculture and horticulture to which a good knowledge of the soils is a prime consideration. Some of the deposits found and especially the leached sands lying under the widespread soils of the Sollom complex are also of value industrially in providing sand for glassmaking, so the memoir can be expected to be of value not only to those engaged in agriculture but also to industry. The possibility, too, of important changes in the organic soils of the area due to losses by oxidation and shrinkage makes the map and its accompanying memoir all the more valuable as a record of present day conditions.

The book is well bound and printed and has excellent colour reproductions of photographs of representative soil profiles which form a useful supplement to the descriptions, especially for farmers and others unfamiliar with colours described using the Munsell system of notation. Altogether the memoir is a valuable addition to our knowledge of the soils of Lancashire which should be widely read by all who are interested in the subject.

Copies may be obtained from the Librarian, Rothamsted Experimental Station, Harpenden, Herts. Price 30s.

J.W.

books received

Forestry Commission.

Research and Development Paper No. 51.
Experiments on the Rehabilitation of Uneconomic Broadleaved Woodlands.
R. F. Wood, A. D. S. Miller and M. Nimmo.

Research and Development Paper No. 58.
Work Study in Silvicultural Operations with Particular Reference to Weeding.
N. Dannatt and W. O. Wittering.

Research and Development Paper No. 59.
Work Study in the Improvement of Timber Harvesting Efficiency.
A. A. Rowan.

Forest Record No. 62.
Plantations on Mediaeval Rigg and Furr Cultivation Strips.
T. C. Booth.
H.M.S.O. 3s.

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RC 213/132/012

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